Software-Defined Networking and the Floodlight controller

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Overview

Big Switch Networks is a market leader in Software-Defined Networking and a strong proponent of OpenFlow technology.

Open Source Projects include:
- Floodlight
- Indigo
- OFtest
- More to come...

Yes, we’re hiring!
- Contact me or careers@bigswitch.com

People @ Big Switch

Guido Appenzeller
CEO, Big Switch Networks
Former Consulting Assistant Professor at Stanford University, led the team that developed OpenFlow 1.0

Rob Sherwood
MTS, Big Switch Networks
Author of FlowVisor and key architect of OpenFlow 1.0

Dan Talayco
MTS, Big Switch Networks
Former member of the Stanford OpenFlow Team. Led development of the Indigo reference implementation

Others include:
Isabelle Guis, Omar Baldonado, Howie Xu, Mansour Karam, Nick Bastin, Saurav Das, and many others...
What is “Open” Software-Defined Networking?
Open Software-Defined Networking

Being open and vendor agnostic is critical to success

1) **Open APIs**

2) **Open source**

3) **Open Protocols**

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Floodlight Overview
An Apache licensed OpenFlow Controller

- Developer friendly Apache license
- Easy to use, extensible Java development environment
- Enterprise grade - Core engine used and supported by Big Switch Networks (running in production today)
- Supports a broad range of physical and virtual OpenFlow switches
- OF 1.0 compliant today – future OF versions on the way
Floodlight Users and Contributors

Floodlight Adopters:

- University research
- Networking vendors
- Users
- Developers / startups

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# Floodlight Switch Compatibility

A snapshot from Interop

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</table>

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Floodlight Growth

Downloads of Floodlight since January launch

- Over 200 mailing list posts / month
- Run rate of 1200+ downloads / month
Building Floodlight
Fast...and easy...

Download from Github

$ git clone git://github.com/floodlight/floodlight.git

$ sudo apt-get install build-essential default-jdk ant python-dev

$ cd floodlight; ant

$ java –jar target/floodlight.jar

Get the VM (including mininet)

$ wget http://floodlight.openflowhub.org/files/floodlight-vm.zip

(login as “floodlight” user, no password)

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Recently launched:

- Module system
- Ubuntu PPA’s
- Quantum / OpenStack
- Web UI
- Performance improvements

Roadmap:

- OpenFlow 1.x support
- Command line interface
- Persistent storage
- Python / Jython support
- Firewall, Load balancer apps
- Web UI 2.0
- Stable northbound APIs
- Better Documentation
Floodlight Programming Model

Northbound APIs

**IFloodlightModule**

- Java module that runs as part of Floodlight
- Consumes services and events exported by other modules
  - OpenFlow (ie. Packet-in)
  - Switch add / remove
  - Device add / remove / move
  - Link discovery

**External Application**

- Communicates with Floodlight via REST
  - Virtual networks
  - Normalized network state
  - Static flows
What Can You Do with Floodlight?
Floodlight OpenStack Integration
Virtual Networking Support

Components:

- RestProxy plugin runs inside Quantum module in OpenStack
- VirtualNetworkFilter implements layer 2 isolation based on MAC

Highlights:

- Supports physical and virtual switches in OpenFlow networks

Caveats:

- No multicast and broadcast isolation
- All DHCP traffic allowed
Programmable Patch Panel

A Floodlight iPhone application

- A simple programmable patch panel built from:
  - Floodlight
  - Pronto 3290 switch running Indigo

- Uses Static Flow Pusher API to redirect traffic between two ports

- Runs remotely on the iPhone!

- Available: http://virtualnow.net/2012/05/03/using-an-openflow-switch-as-a-programmable-patch-panel/
vArmour: Security for OpenFlow

- Founded by security veterans from NetScreen
- Security device integrated with the Floodlight controller
- Showcased the first SDN-capable deep packet inspection working with Floodlight at the Open Networking Summit

Contact: http://www.varmour.com/
MobiFlow: Floodlight iPad Interface

- Built by Saurabh Sabnis, Georgia Tech
- Interface to view switches, hosts, network topology, and statistics
- Access to Static Flow Pusher API
- Available: Coming soon
# Google Summer of Code

## In progress...

<table>
<thead>
<tr>
<th>Student</th>
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<tr>
<td>Ayaka Koshibe</td>
<td>Integration of Floodlight and FlowVisor</td>
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<tr>
<td>Amer Tahir</td>
<td>Floodlight Firewall / ACL module</td>
</tr>
<tr>
<td>Hasanat Kazmi</td>
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Get Involved with OpenFlowHub
Join the community!

What it is:

1. A community of open source OpenFlow developers

2. An OpenFlow Blog (available for guest authors)

3. Free hosting, tools, and promotion for open source projects
   - Wiki, forums, bug tracking tools, logos, etc.

Projects:

Get involved:

- Submit a project
- Write a blog post
- [http://www.openflowhub.org](http://www.openflowhub.org)
- Contact: mike.cohen@openflowhub.org
Interested in Learning More?

- Check out the website
  - http://floodlight.openflowhub.org

- Join the mailing list:
  - http://groups.google.com/a/openflowhub.org/group/floodlight-dev/topics
  - Or just email floodlight-dev@openflowhub.org

- Get the code:
  - http://floodlight.openflowhub.org/download
Thanks!

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