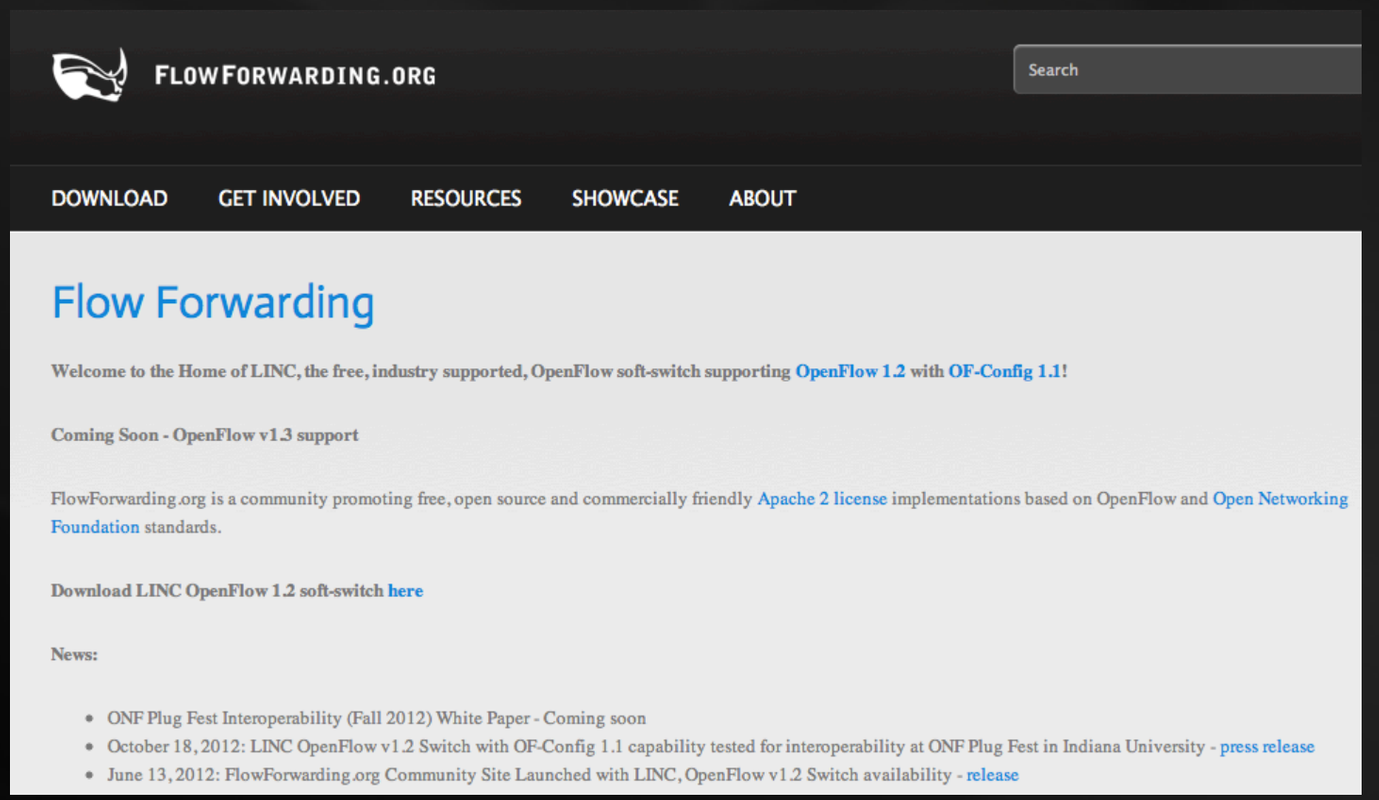
FlowForwarding.org

What is FlowForwarding.org?

- An open source community
- Promotes OpenFlow related projects
- All projects under Apache v2 License
- Projects start in incubation and move to real ones
- Supported by Industry



Current

- Projects
  - LINC Switch – soft-switch implementing OF 1.2/1.3.1 and OF-Config 1.1
- Incubation
  - Hadoop Acceleration

LINC

a pure OpenFlow soft switch

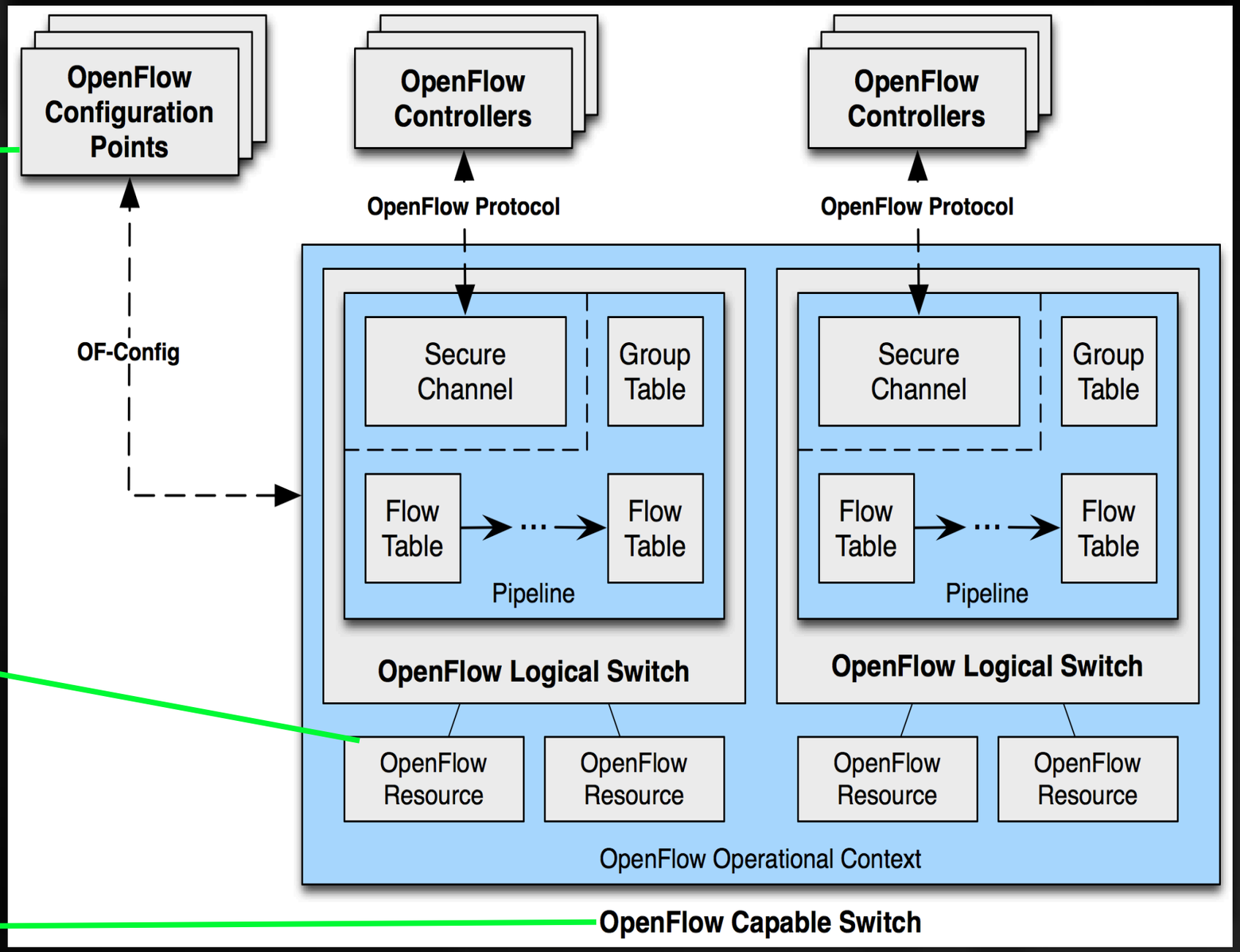
for practitioners marching towards
Software Defined Networks

LINC Switch

- OpenFlow (OF) v1.2/1.3.1 Specification compliant
- Works with any OF-Controller that can support OF v1.2/1.3.1
- Feature development focus:
  - Pure OF based networks
  - Less or no priority towards traditional networking interoperability
- Cross platform Implementation
  - Current: User space only
  - Future: support for Kernel space forwarding
  - External interfaces
    - Linux kernel 3.3 openVswitch module
    - API for specialized network hardware drivers
- Upgrades in real-time (hot-code loading)
  - minimal down time

LINC Switch Architecture

- Provisions OF Capable Switches
- Defines instances of logical switches
- Dispatches resources between switches



- Physical Ports

- Consists of ports & forwarding engine
- Container for multiple logical switches

Why Erlang?

High Availability/ Reliability

- Built-in fault tolerance
- Software upgrade during runtime
- Suitable for server-side applications

Powered by ERLANG

Less Effort

- 4–20 times less code that C++/Java
- Suitable for rapid prototyping
- Powerful middleware and libraries

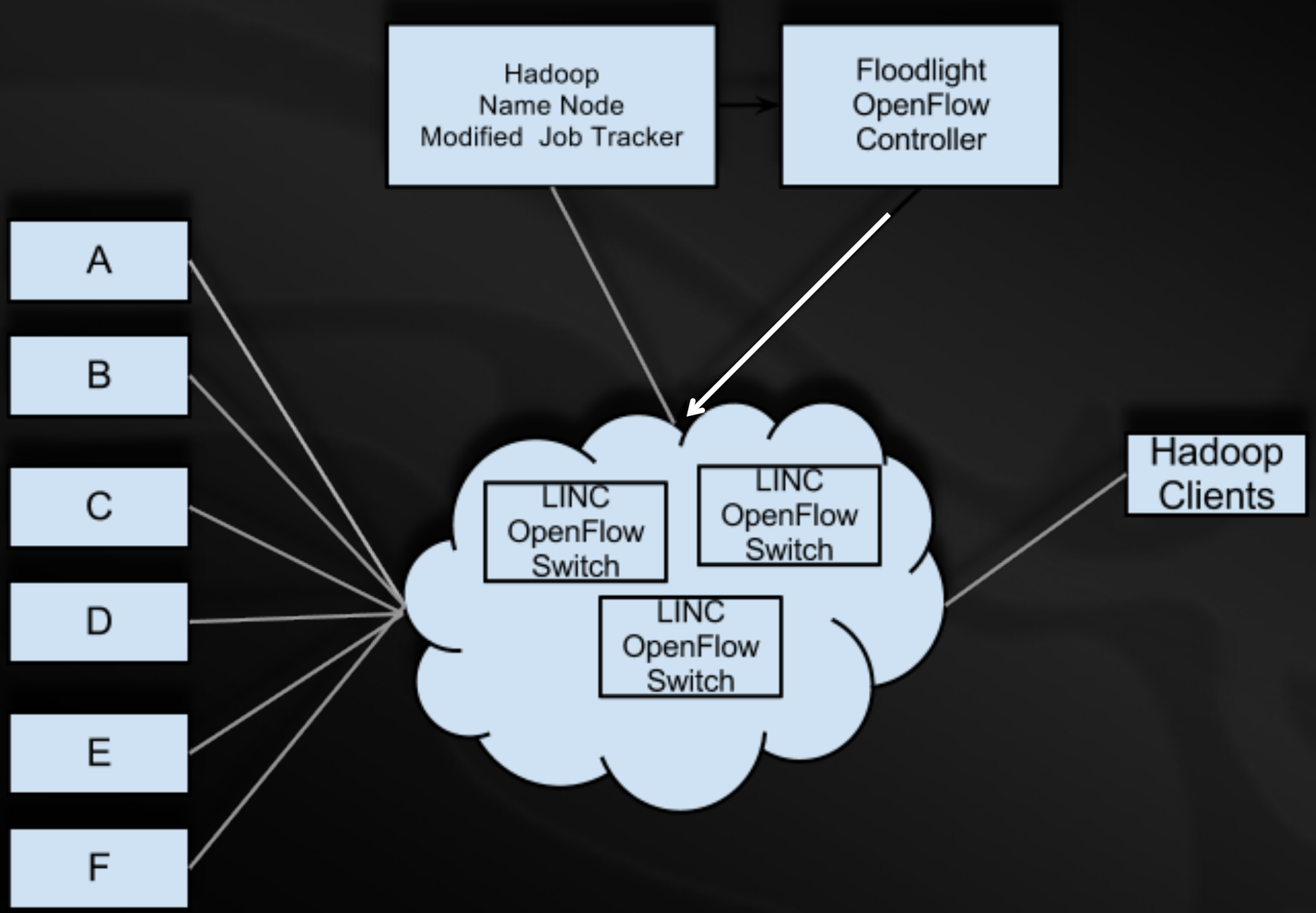
Scalability

- Out-of-the-box Distributed Architectures
- Massive concurrency
- Symmetric Multi-core Support

Hadoop Acceleration

- Leading open source compute cluster for BigData
- Designed to operate on commodity systems on commodity networks
- Supports MapReduce model of distributed computing
- Processes massive amounts of data for Analytics
- Clusters have very large data movement between execution phases of MapReduce
- Goal is to utilize OpenFlow to improve data transfer times by controlling the network from within the Hadoop MapReduce Framework
- New trends:
  - High Performance Computing is transitioning to use commodity clusters
  - High Performance Interconnects like Infiniband being explored for Hadoop clusters

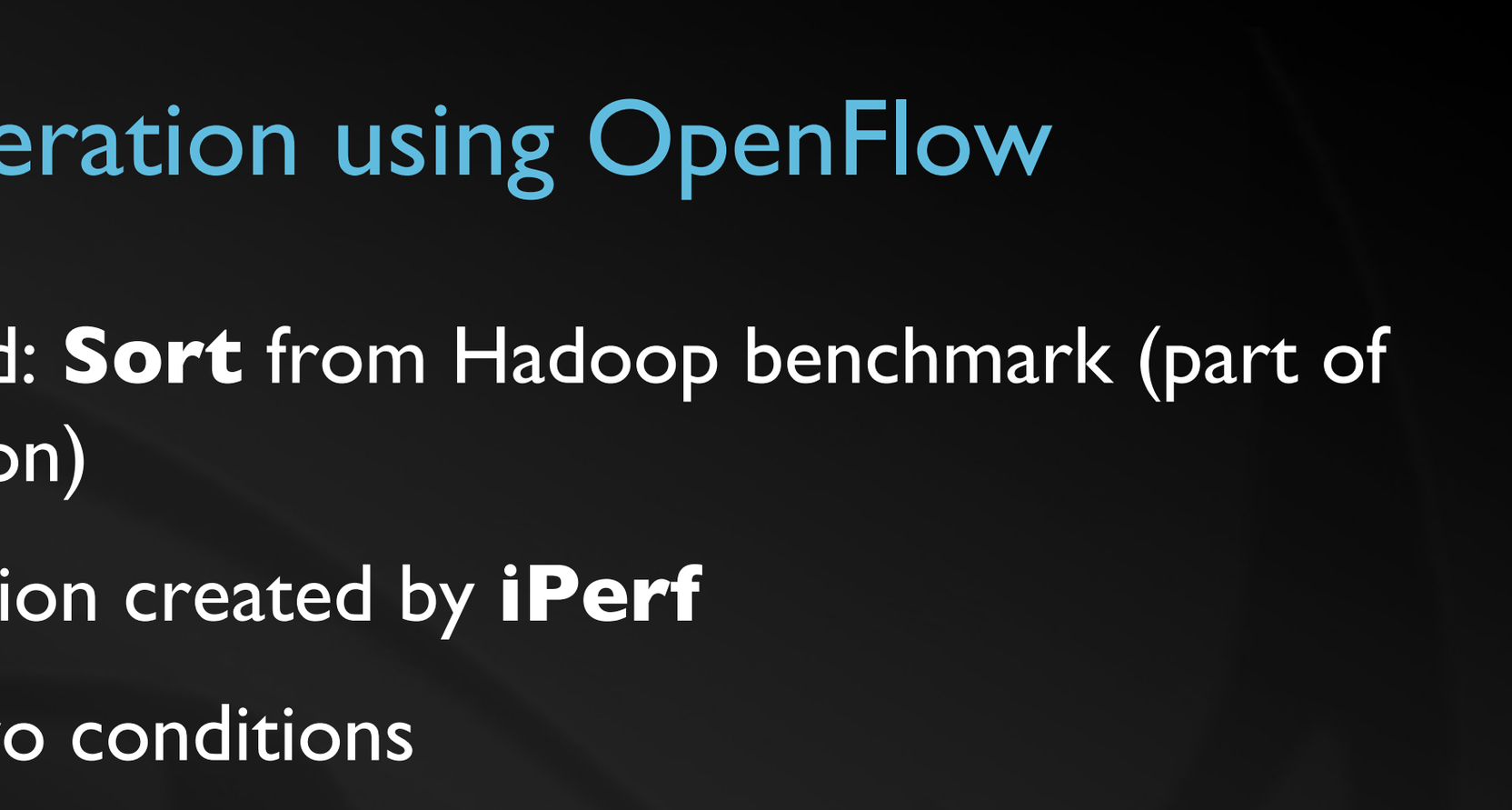
Hadoop OpenFlow Architecture



Hadoop Data Nodes
Modified Task Trackers

Hadoop Acceleration using OpenFlow

- Test program used: **Sort** from Hadoop benchmark (part of Hadoop distribution)
- Network Congestion created by **iPerf**
- Test run under two conditions
  - Setting lower priority for iPerf flow using OpenFlow QoS
  - Without setting priority



Timeline

FlowForwarding Community launched (June 2012)
+ alpha LINC Switch code availability

LINC Switch beta v1.0 (Fall 2012)

LINC Switch v1.0 (2013)

Want to help?

- Engineering
  - Develop
  - Test
  - Document
- Community
  - Sponsor Flow Forwarding activities
  - Promote Open Networking with Open Flow projects

Current Listed Contributors

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