tinyNBI: Distilling an API from Essential OpenFlow Abstractions

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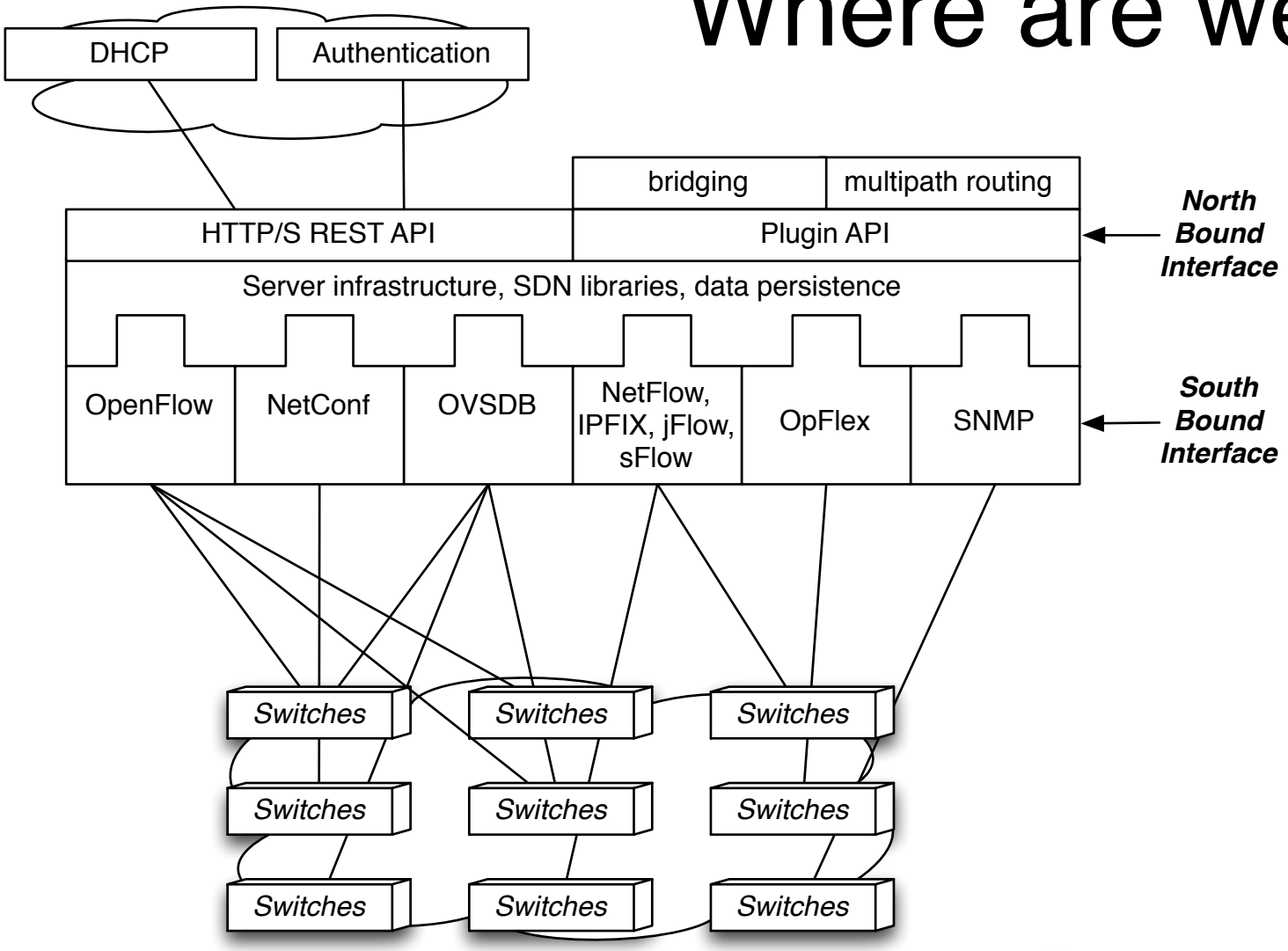
Where are we?


DHCP
Authentication
bridging
multipath routing
HTTP/S REST API
Plugin API
North Bound Interface
Server infrastructure, SDN libraries, data persistence
OpenFlow
NetConf
OVSDB
NetFlow, IPFIX, jFlow, sFlow
OpFlex
SNMP
South Bound Interface
Switches
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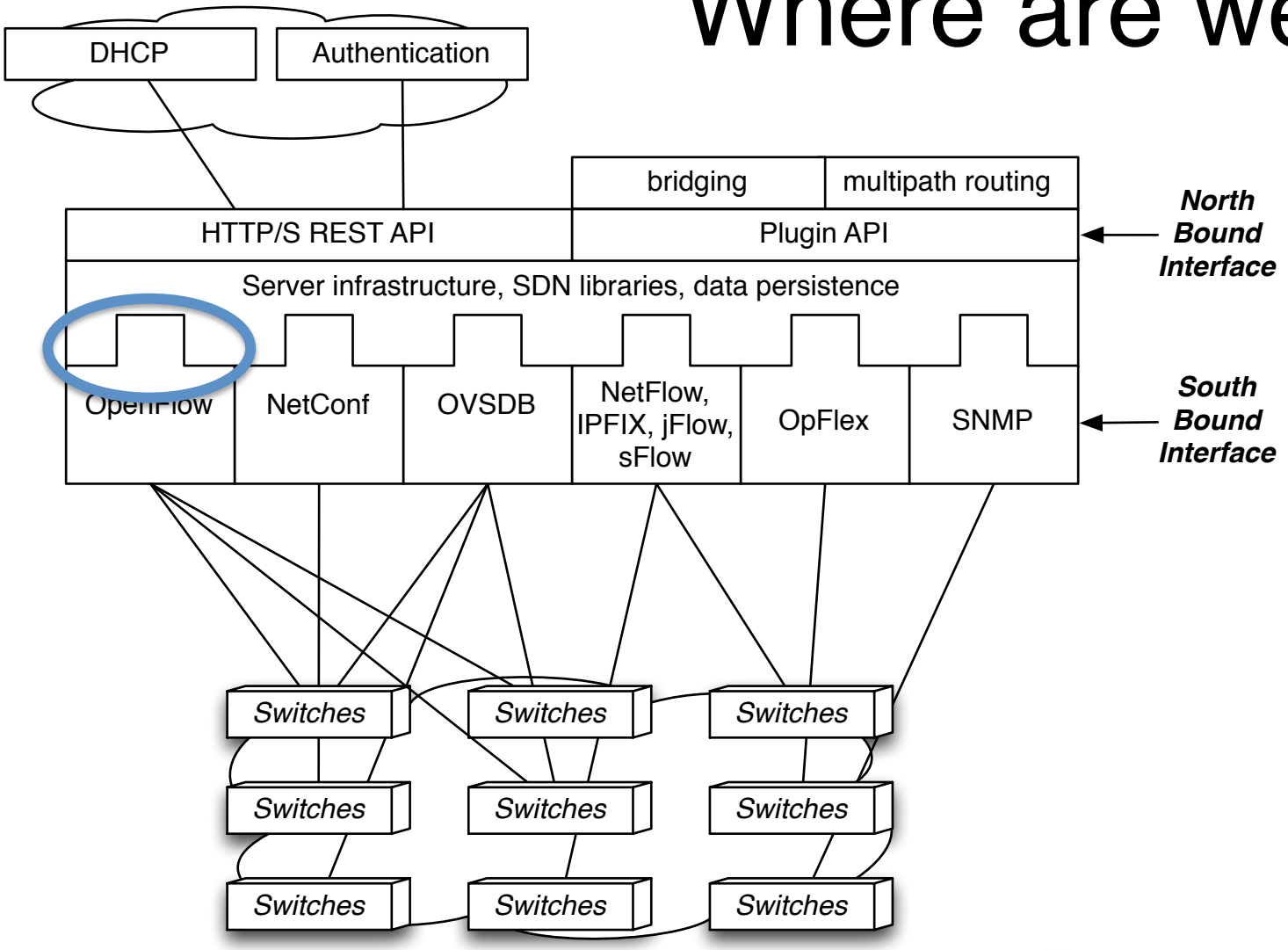
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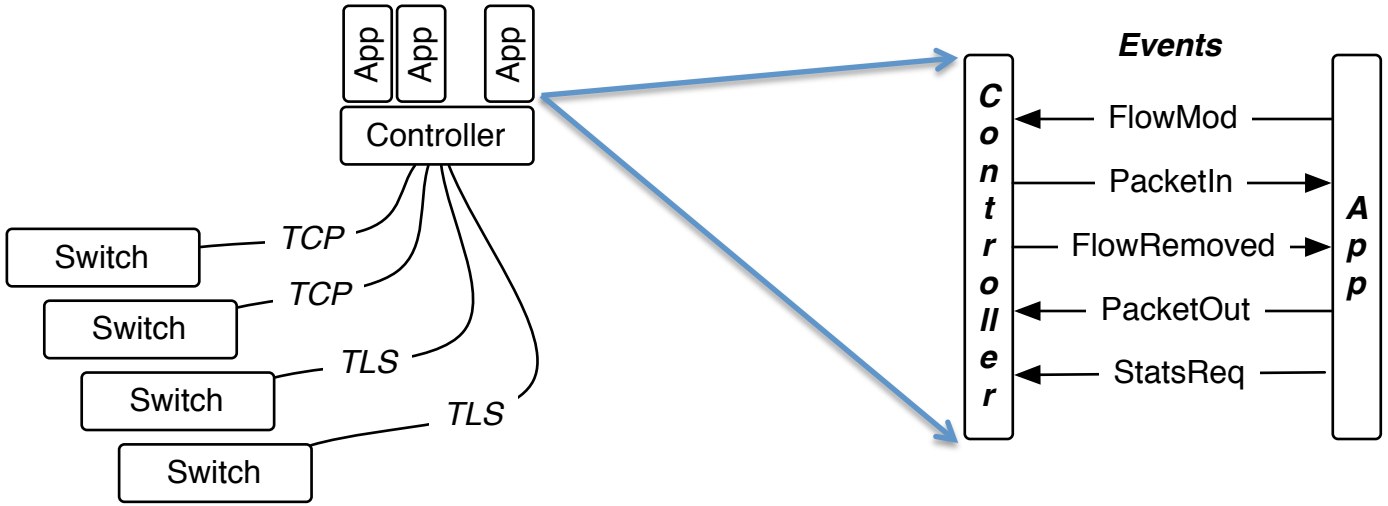
North Bound Interface (NBI)

- Glue between controllers and applications
- API for writing OpenFlow applications



Most production networks …

- are heterogeneous
- contain multiple vendors
- contain multiple device types
- operate varying versions of software

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OpenFlow …

- has five versions in production
- has a new versions coming
- is not additive
- has a high degree of optionality

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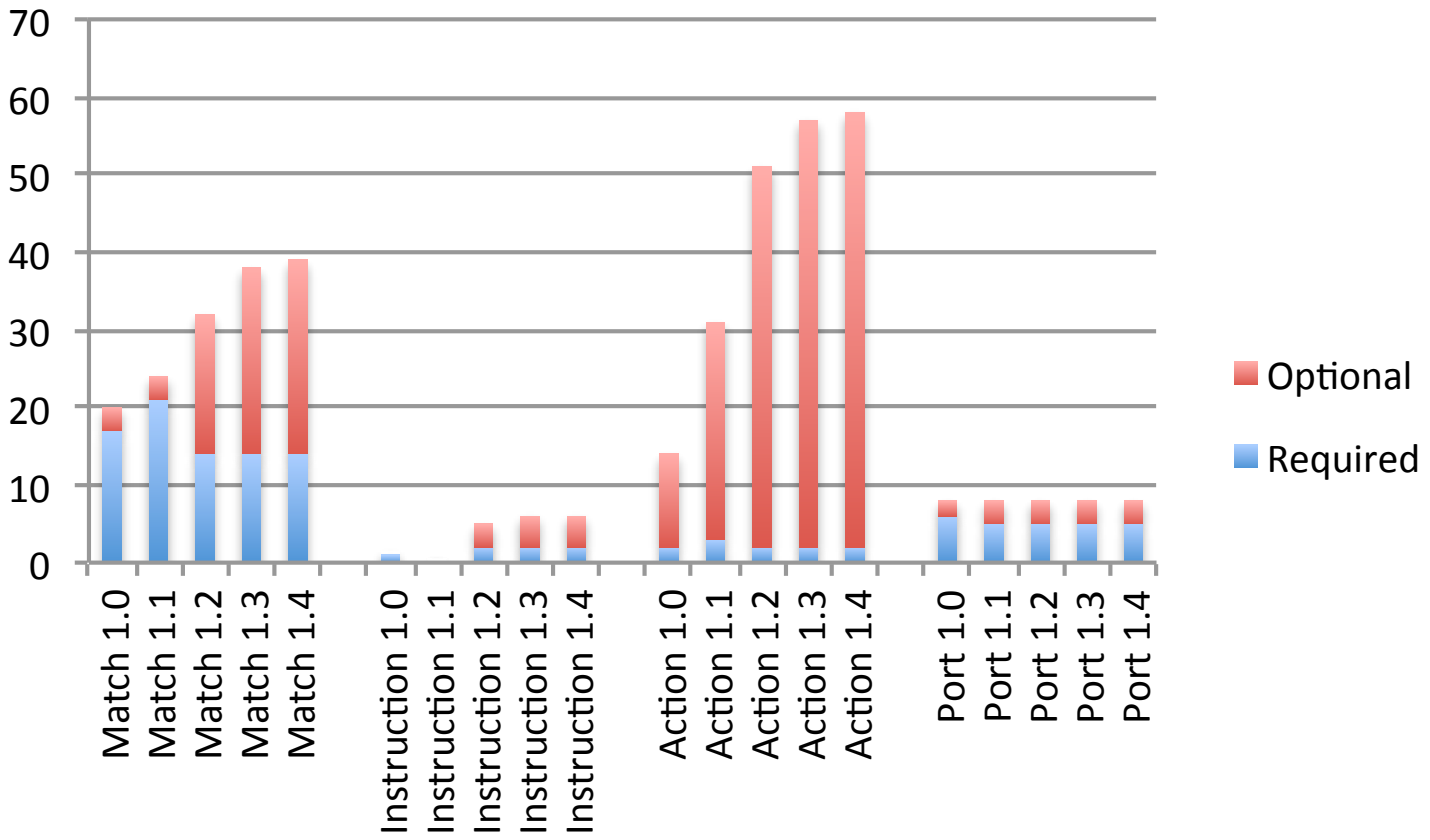
Most Features are Optional



Writing OpenFlow applications …

- requires extensive capability detection
- requires extensive error handling
- is not possible without apriori knowledge
- is not for the average programmer

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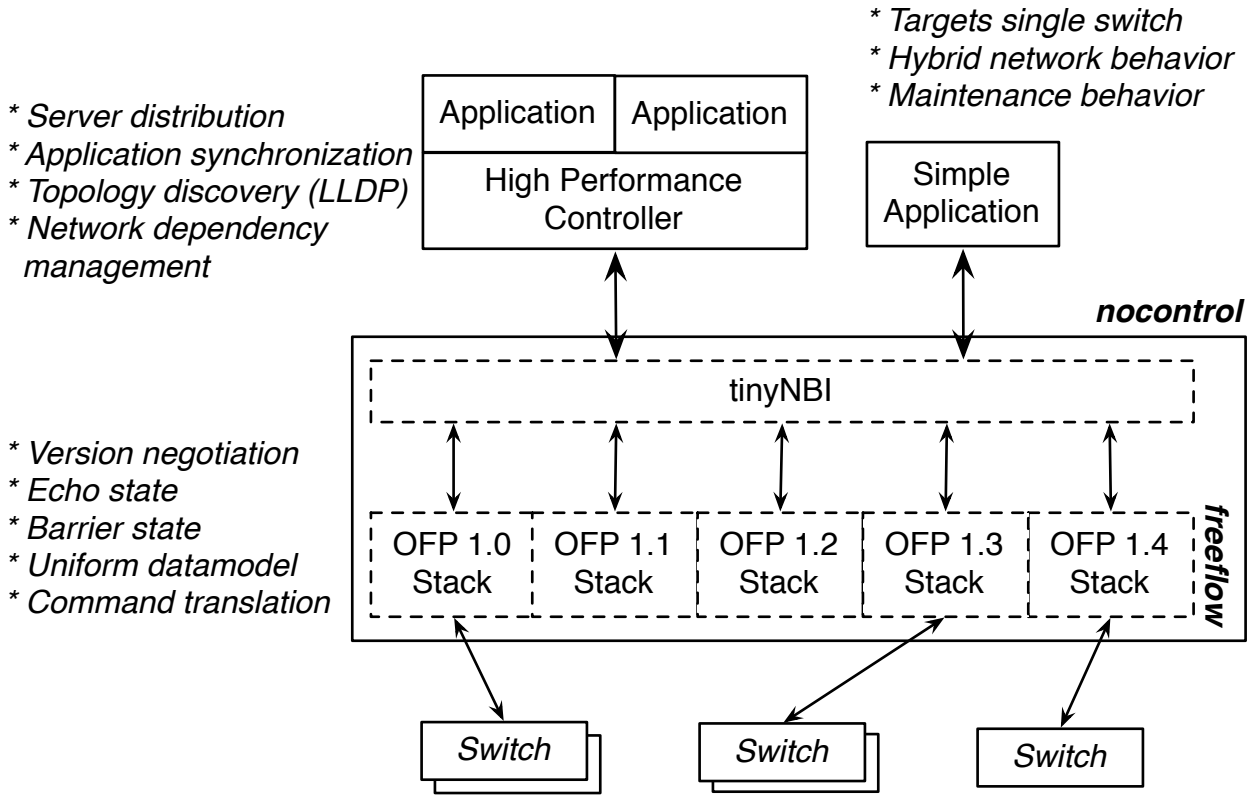
Introduce a tiny NBI



Introduce a tinyNBI that …

- has a simple sockets “like” interface
- abstracts away OpenFlow version details
- simplifies the capability detection
- supports cross language bindings

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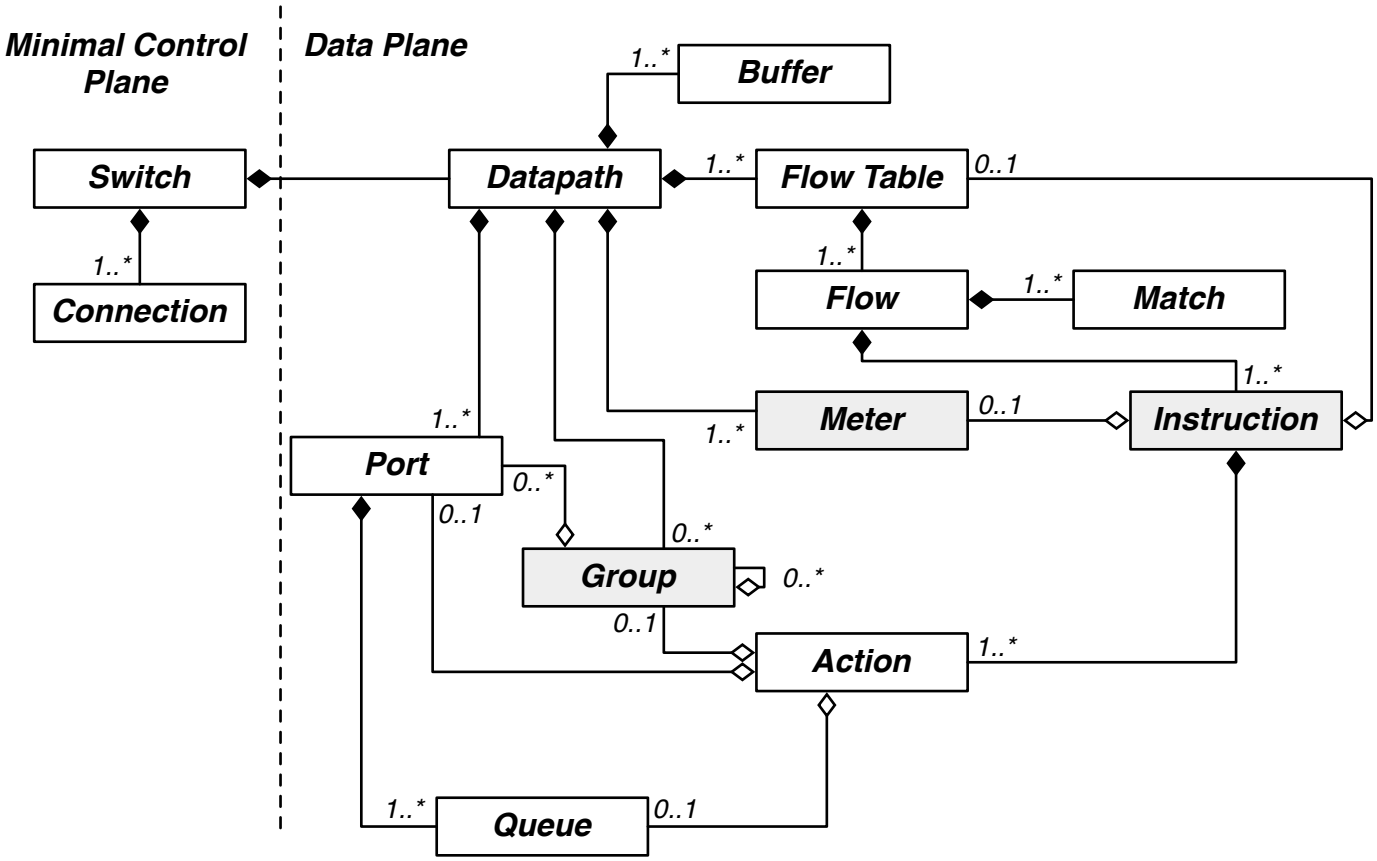
Read/Write from/to the Data Model



Abstractions have …

- capabilities that are read only
- configurations that can be read or written
- statistics that are read only
- event generation: packet, port, flow

tinyNBI also introduces…

- an application lifecycle
- an allocation model for finite resources
- capability requirements statement
- non-native feature offload

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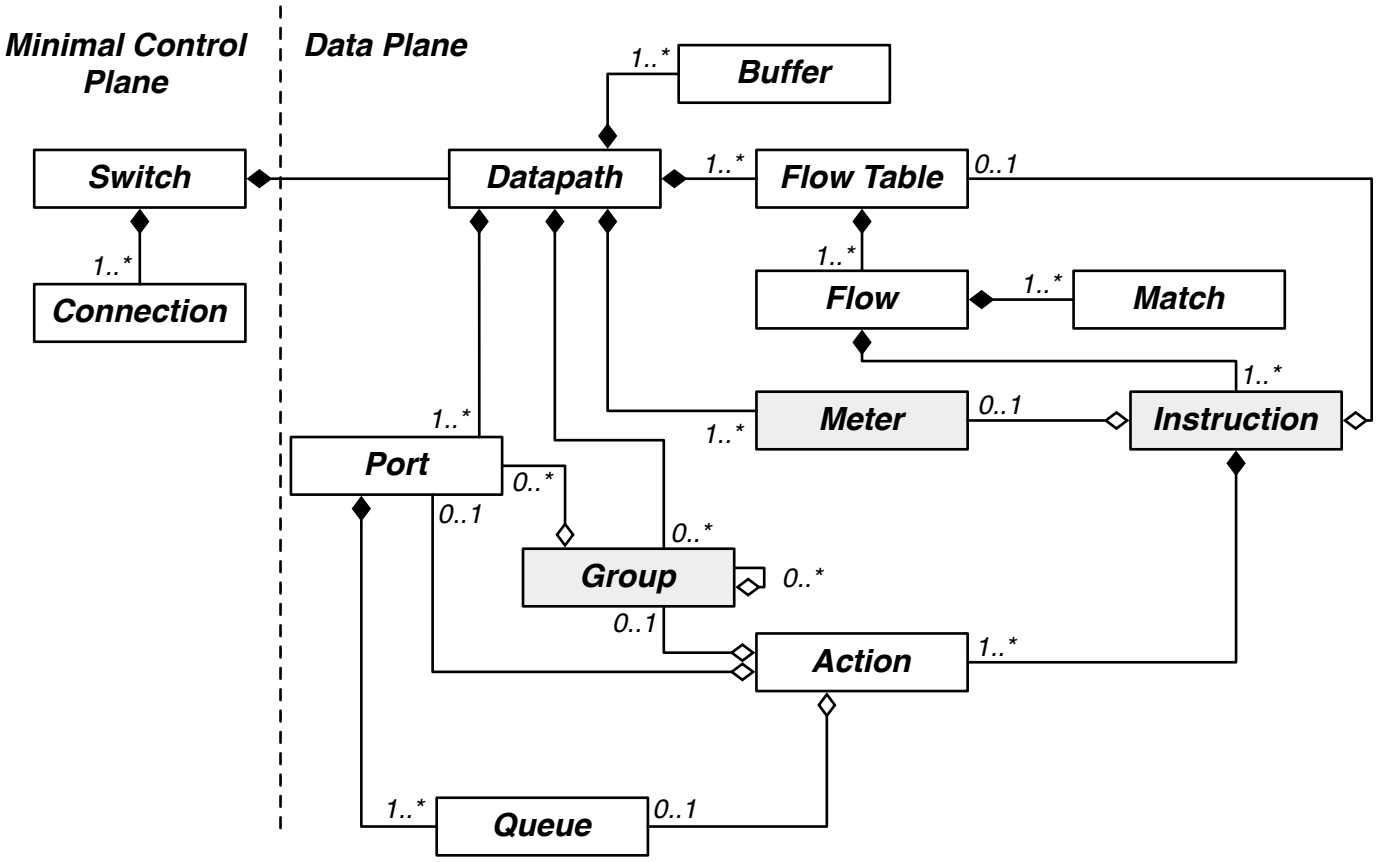
Questions?


Minimal Control Plane
Data Plane
Buffer
Switch
Datapath
Flow Table
Connection
Flow
Match
Meter
Instruction
Port
Group
Action
Queue
1..*
0..1
0..*