Sentient networking

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Internet of Senses
Network sentience through distributed sensing, intelligence and programmable functionality
50 shades of complexity
SDN to the rescue?

- APPs: monitoring, security, …

- Controller a.k.a. Network Operating System
  - Centralized decision making
  - Programmable

- Switches
  - Only need to worry about forwarding
  - Reduced CapEx
What about the data-plane?
The power of P4 programming

Without the hassle:

```
#include <core.p4>
#include <v1model.p4>
struct metadata {}
struct headers {}
parser MyParser(packet_in packet, 
    out headers hdr, 
    inout metadata meta, 
    inout standard_metadata_t standard_metadata) {
    state start { transition accept; }
}
control MyVerifyChecksum(inout headers hdr, inout metadata meta) {
    apply {}
}
control MyIngress(inout headers hdr, 
    inout metadata meta, 
    inout std_mtdt_t std_mtdt) {
    apply {
        if (std_mtdt.ingress_port == 1) {
            std_mtdt.egress_spec = 2;
        } else if (std_mtdt.ingress_port == 2) {
            std_mtdt.egress_spec = 1;
        }
    }
}
```

import drop_heavy_hitters
import drop_ddos

define intent dropHeavyHitters:
    to any
    for traffic('any')
    apply drop_heavy_hitters
    with threshold('more', 20)

define intent dropDDoS:
    to any
    for traffic('any')
    apply drop_ddos
    with threshold('more', 5)

How to program the programmable network?
Eradicating NP-hard problems
By not designing protocols in isolation

Network sentience

Data-driven networking

Artificial intelligence

Networking primitives
More info? Contact me at

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