

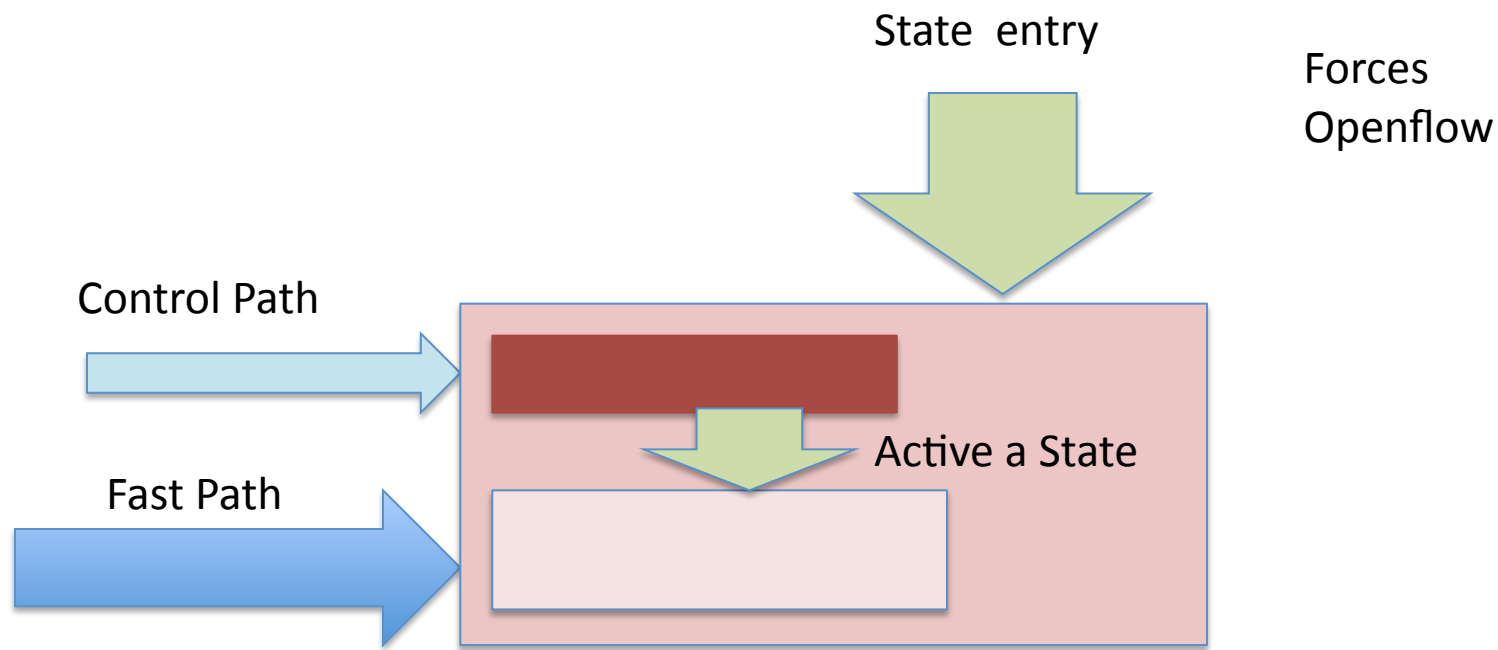
# Towards an Accelerated FPMOD based on ephemeral States

Ilyas snaki, Salah Eddine Hamadi,  
Omar Cherkaoui

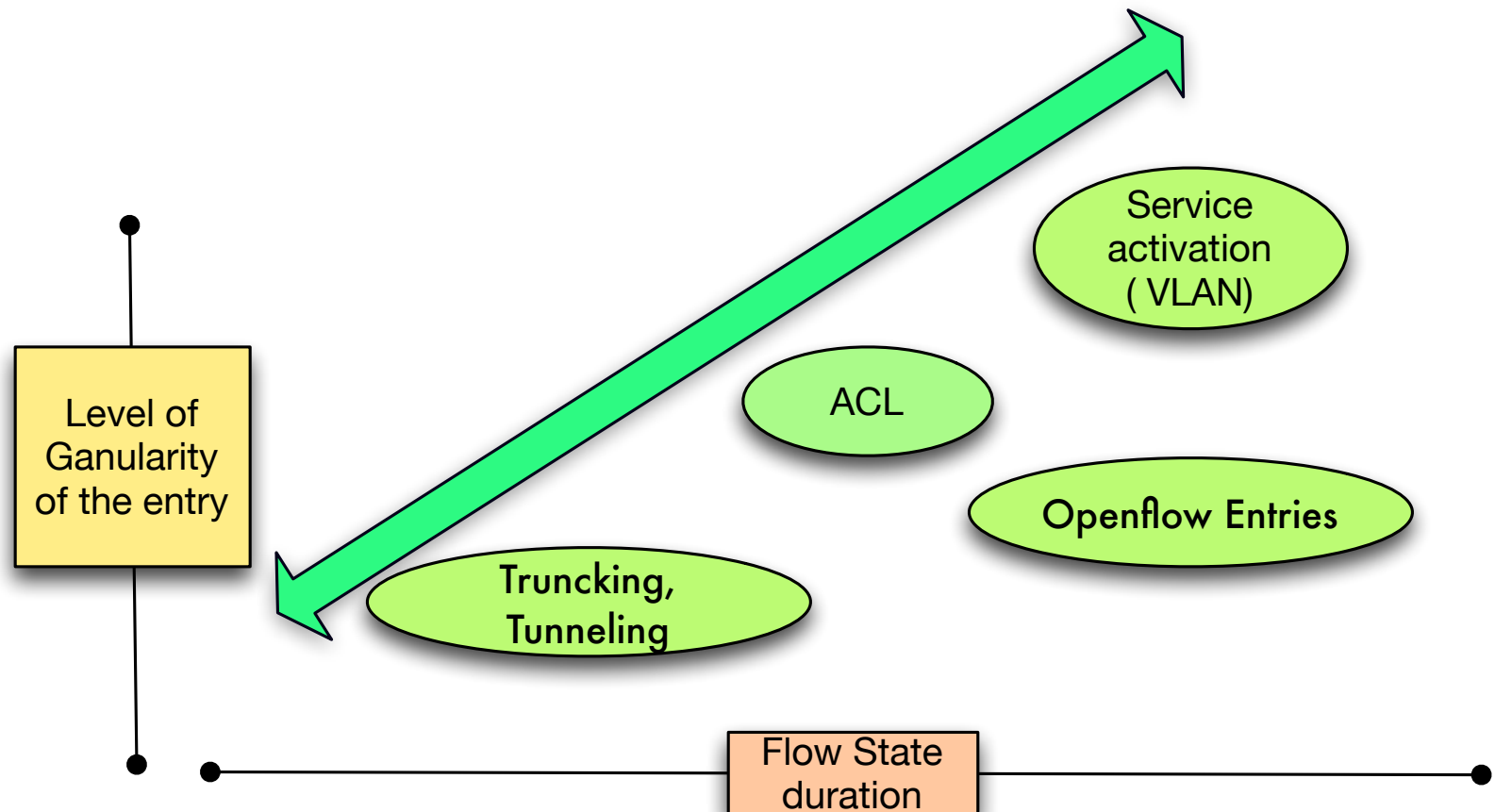


# Why Ephemeral States?

- Our work highlights a proposition of an acceleration mechanism for OpenFlow forwarding model based on flow states
- We provide a hardware implementation over Netronome's NFP-3200 platform build around a 20Gbps network processor as a proof-of-concept for our mechanism.
- Ephemeral state are already investigated for Active Network
- An acceleration mechanism for OpenFlow forwarding model will enhance the packet processing performance.



# At which grannularity?



# Challenges

## Avoid the state space Explosion

- Aging Approach
- State Admission control based
  - Short Streaming
  - Long streaming

## Consistency

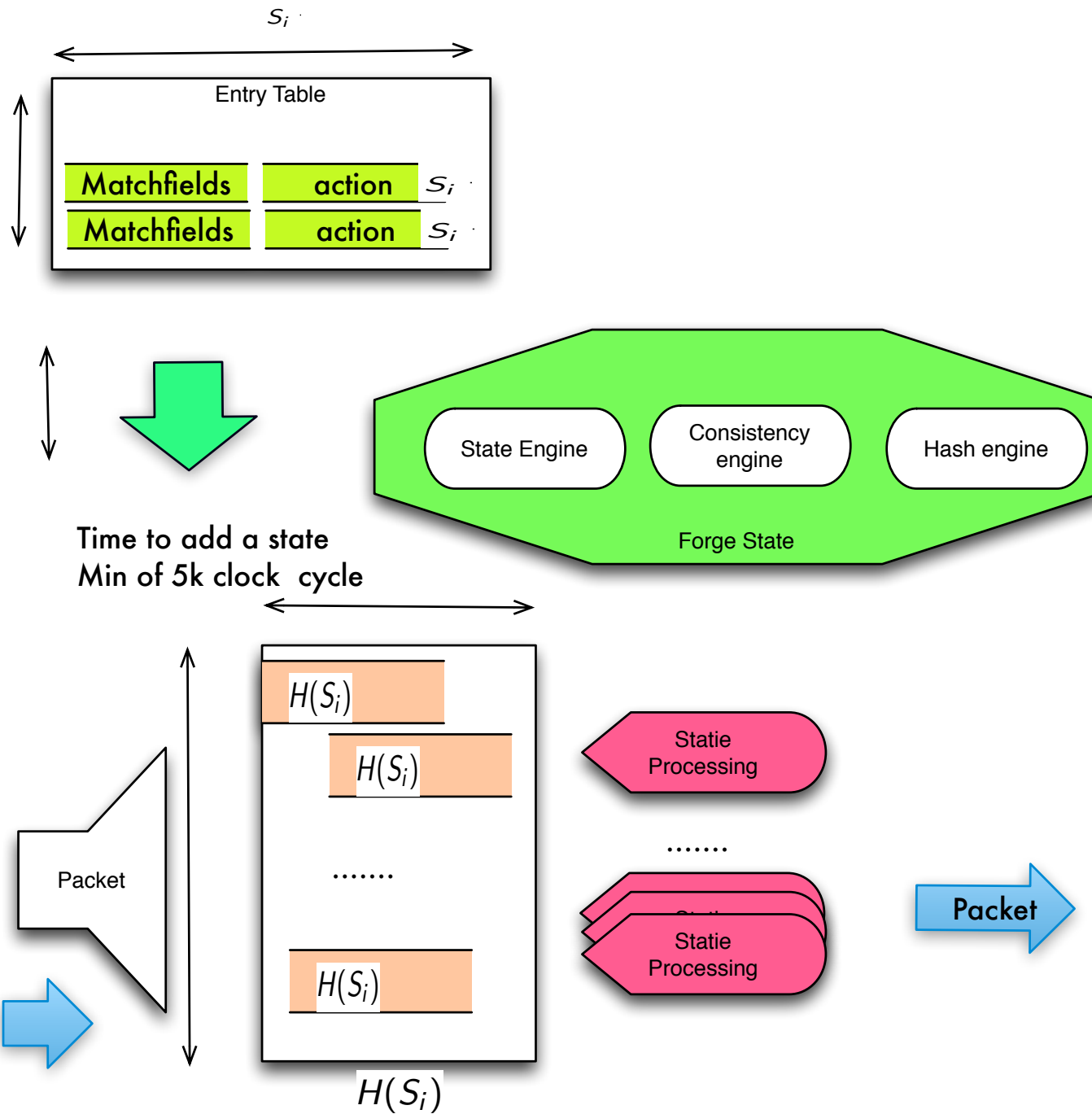
- Hash:
  - Reduce the collision ( Lattice Base approach)
- No flow Overlap
  - No ACL
  - Inspired Classification

## Update the Hash Tables

- Choice
  - SRAM Lookup
  - TCAM

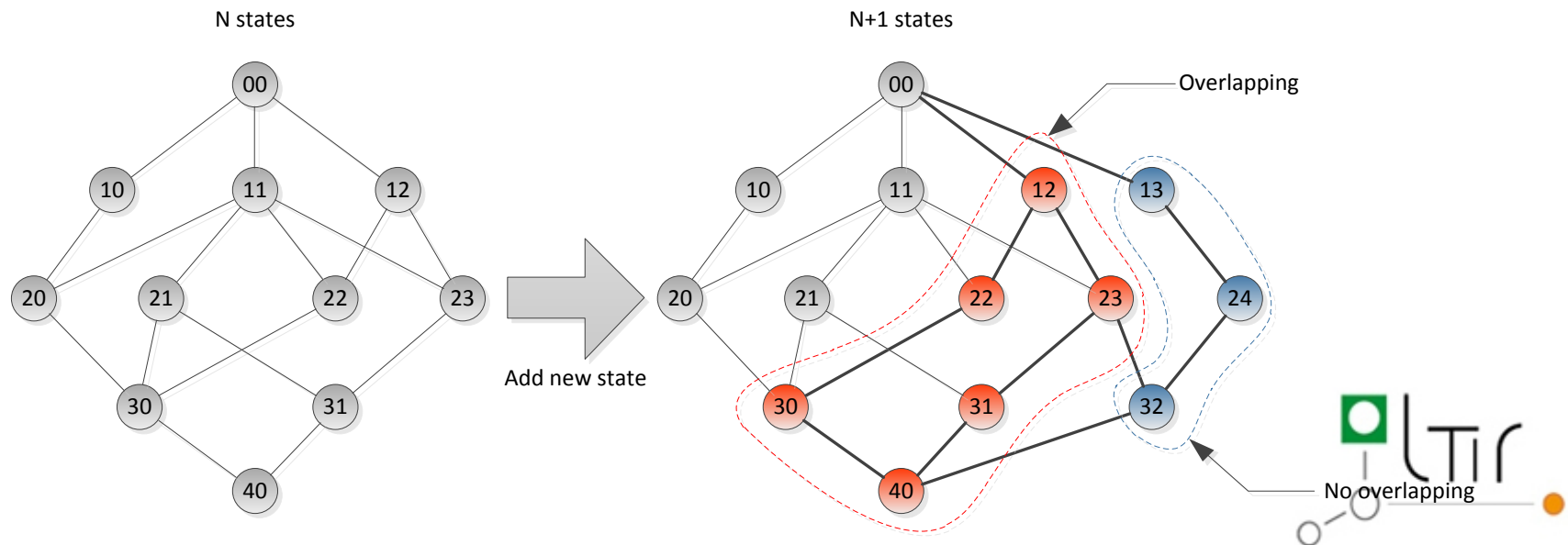




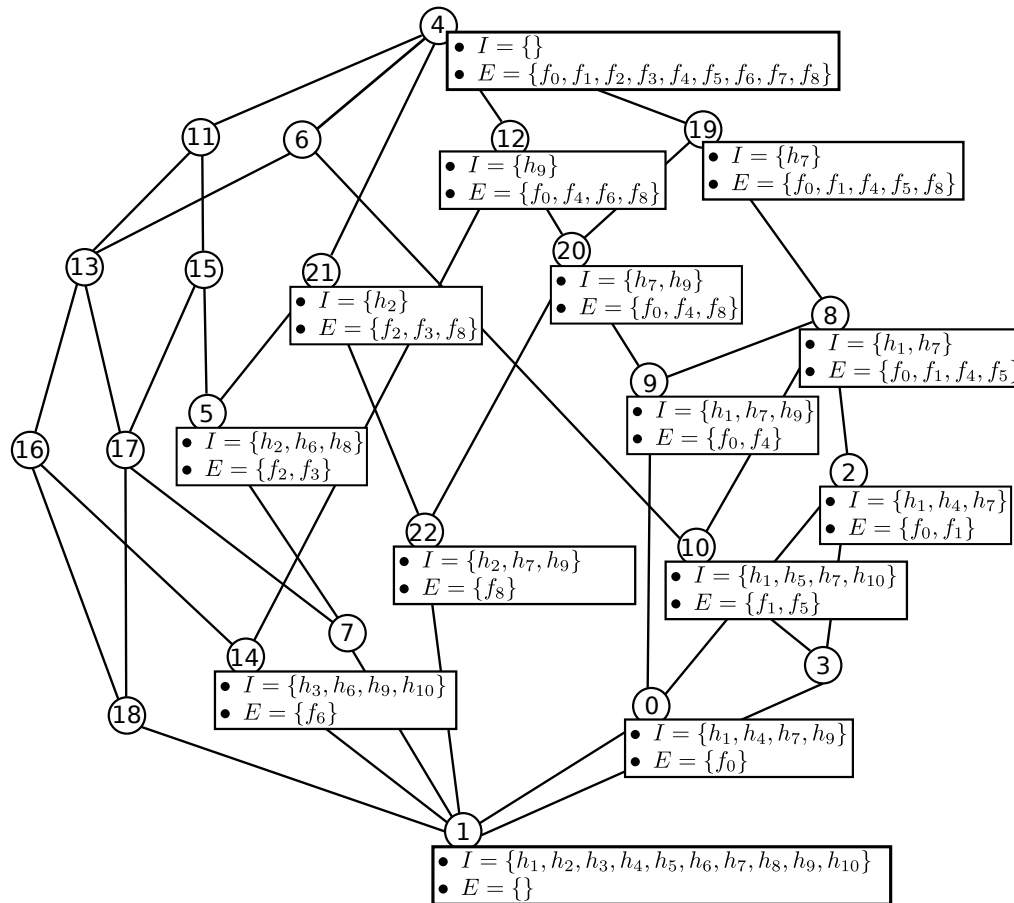


# Lattice based approach to consistent state management

- FCA is a mathematical approach for unfolding the implicit structure induced by a binary relation between a set of individual objects and a set of yes/no properties.
- FCA helps factor out commonalities within a data set.
- More precisely, FCA organizes an (objects X properties) dataset into a hierarchy of groupings based on shared properties. A significant advantage w.r.t. concurrent methods that the hierarchy is made all maximal groups of objects



# Example based on Flow Concepts





# Implementation : Use cases

- Nov3 Tunneling or OTV, VXLAN, STT, NvGRE
- EDV : VDP message
- Truncking,
- Link aggregation group ( LAGS),
- ECMP ( Equal Cost Multi Path)

OTV

EVI

STT

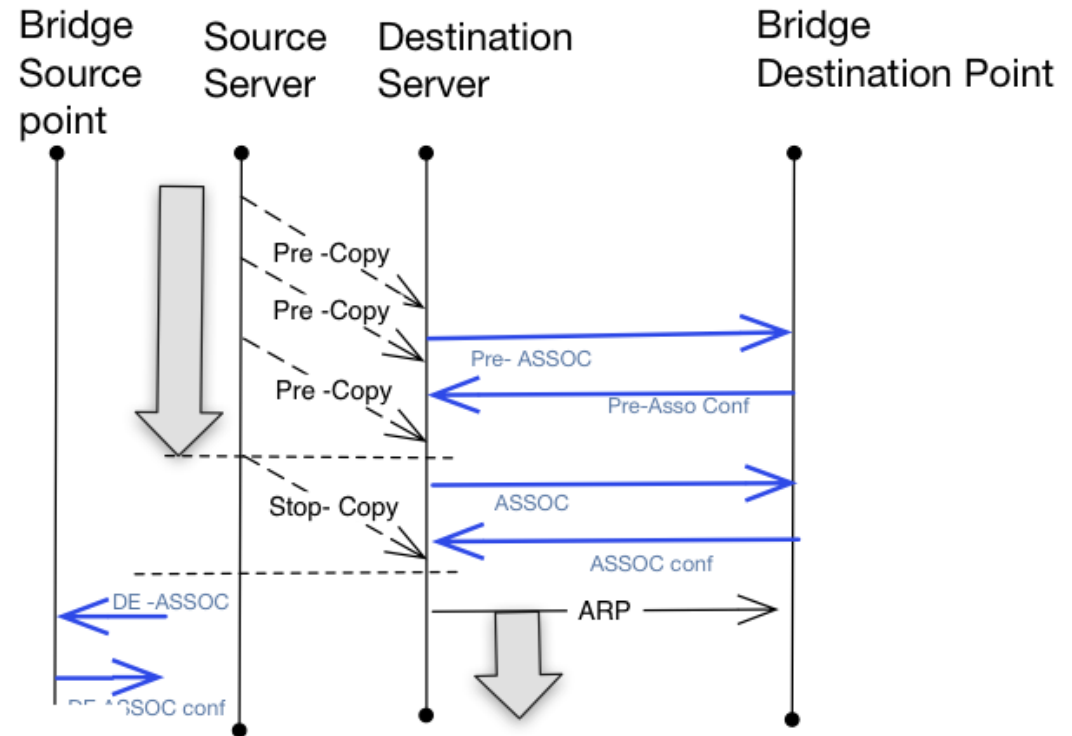
NVGRE

VXLAN



# How to bypass the EVB signalling?

Automated Migration of Port profil( AMPP)



802.1Qbg Edge Virtual Bridge

VSI Discovery and configuration Protocol (VDP)

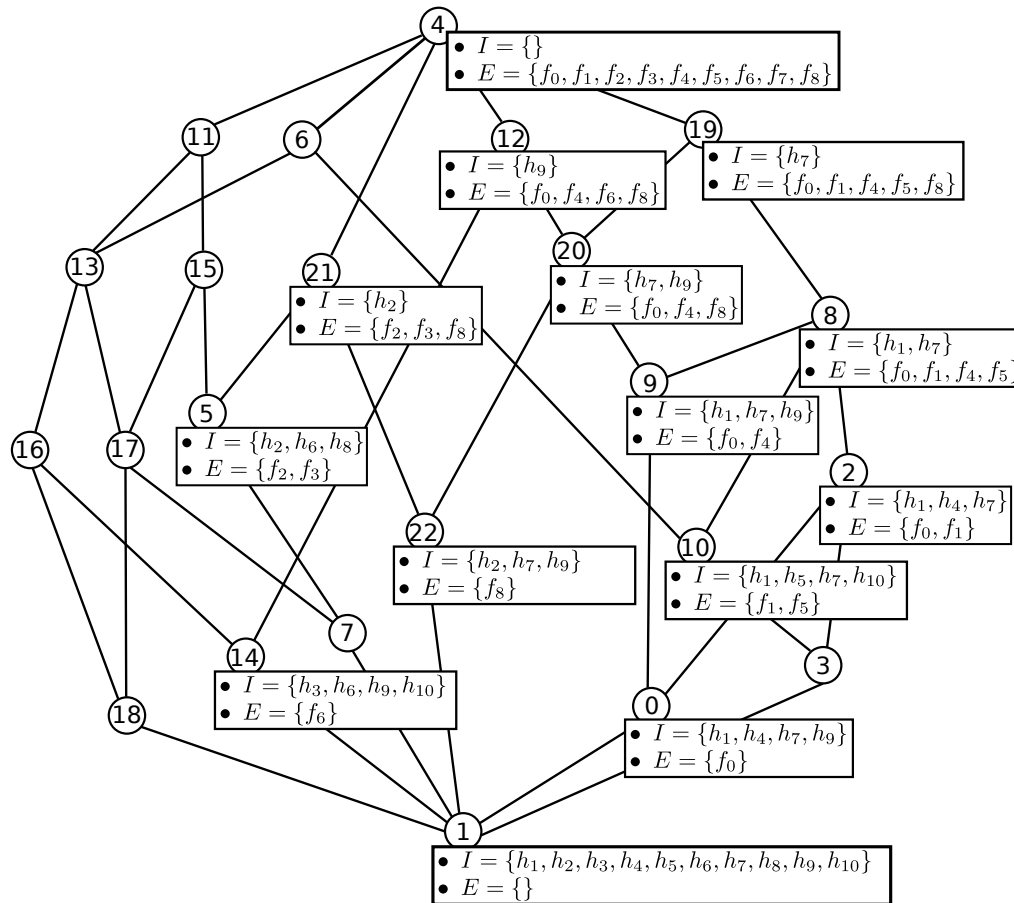
Edge Control Protocol

S-Channel discovery and configuration Protocol (CDCP)

→ VDP Message



# Example of Lattice based on Flow Concepts



# Open Challenges

- Scalability
  - Ressource allocated by service activated
- Level of Abstraction to capture the state:
  - Openflow entry for signaling packet?
  - Describe the behavior state
- Distribute the forwarding model operations over a multi-threaded, multi-core hardware architecture and lookup strategy over SRAM , TCAM
- DO we need to evaluate Active Packet approach?

