Using Minimum Spanning Tree in Dynamic Routing | Part-2

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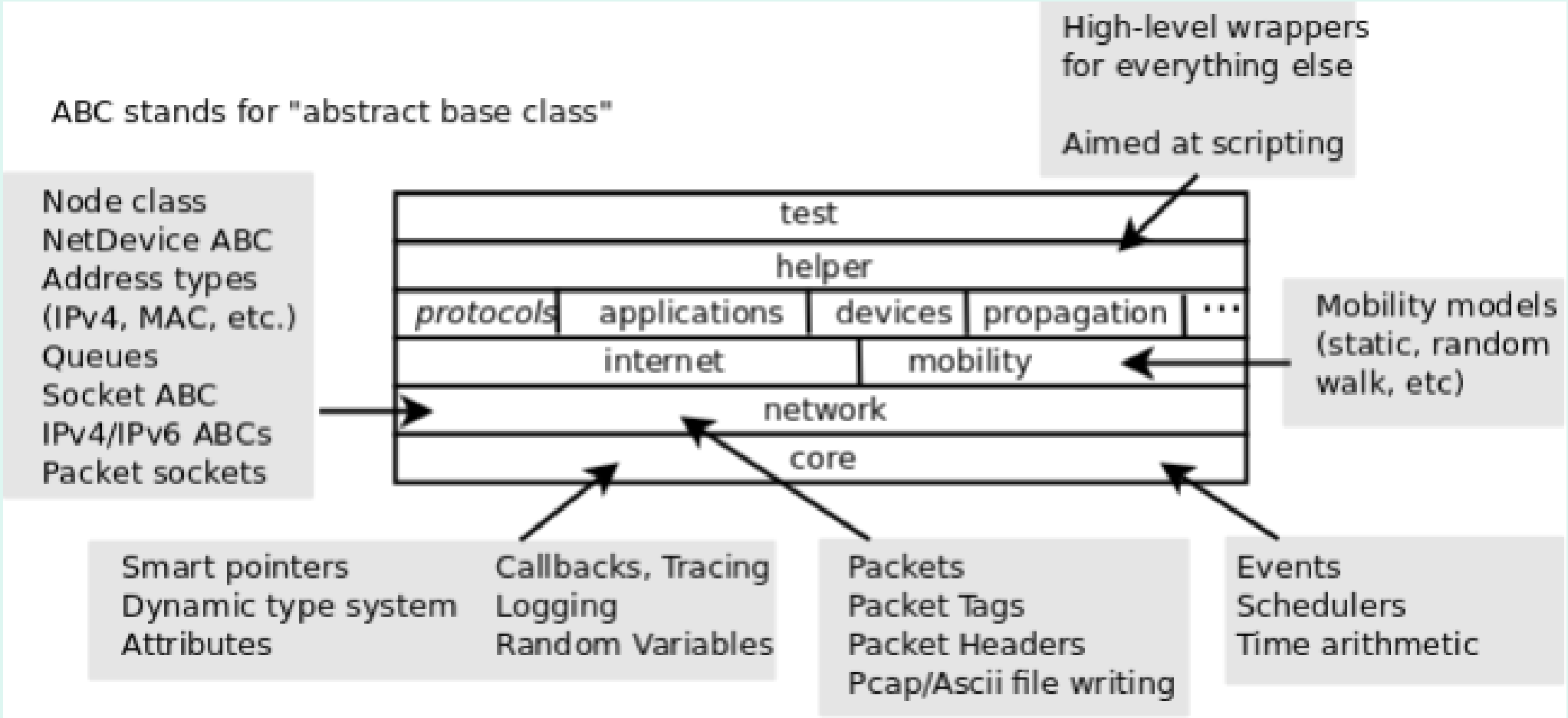
NS3 - Organization



https://www.nsnam.org/docs/release/3.35/manual/html/organization.html

NS3 - Organization

Since, we're working on routing protocol-

Protocol relies on:

- Internet module
- Mobility module

Probable workflow:

- Tweak internet/mobility modules (if required)
- Build protocol model
- Write helper classes
- Simulate

NS3 - Source

Existing NS3 models-

- OLSR (Optimized Link State Routing)
  `ns-3.29/src/olsr/`
- NIX Vector Routing
  `ns-3.29/src/nix-vector-routing`
- DSDV (Destination-Sequenced Distance Vector)
  `ns-3.29/src/dsdv/`
- DSR (Dynamic Source Routing)
  `ns-3.29/src/dsr/`

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OLSR (Optimized Link State Routing)

At a glance

- Send & Process
  - TC
  - Hello and
  - HCNA message
- Send & receive OLSR message
- Compute multipoint relay
- Build routing table

Files

```
olsr-header.h
olsr-header.cc

olsr-repositories.h

olsr-routing-protocol.h
olsr-routing-protocol.cc (3187)

olsr-state.h
olsr-state.cc
```

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NIX Vector Routing

At a glance

- Only applicable for IPv4
- Get adjacent network-devices
- Compute BFS to reach a destination
    - false (if doesn’t exist)
- Builds NIX vector

Files

`ipv4-nix-vector-routing.h`
`ipv4-nix-vector-routing.cc (931)`

NS3 - Source

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  `ns-3.29/src/dsr/`

DSDV (Destination-Sequenced Distance Vector)

At a glance

- Queue packet until a route in found
- Send packet from queue
- Print routing table

Files

```
dsdv-packet.h
dsdv-packet.cc

dsdv-packet-queue.h
dsdv-packet-queue.cc

dsdv-routing-protocol.h
dsdv-routing-protocol.cc (1240)

dsdv-rtable.h
dsdv-rtable.cc
```

DSDV (Destination-Sequenced Distance Vector)

At a glance

- Add, remove, update route
- Get list of destination with next hop
- Print entries in routing table

Files

```
dsdv-packet.h
dsdv-packet.cc

dsdv-packet-queue.h
dsdv-packet-queue.cc

dsdv-routing-protocol.h
dsdv-routing-protocol.cc

dsdv-rtable.h
* dsdv-rtable.cc (350)
```

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- NIX Vector Routing
  `ns-3.29/src/nix-vector-routing`
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  `ns-3.29/src/dsdv/`
- DSR (Dynamic Source Routing)
  `ns-3.29/src/dsr/`

DSR (Dynamic Source Routing)

- Too complex
- Probably not ideal

Files

dsr-routing.h
dsr-routing.cc (3542)

+ 22 more files

src/dsr/model

Internet Model

- Works with
    - SPFVertex class
    - Global Routing Database
    - LSDB

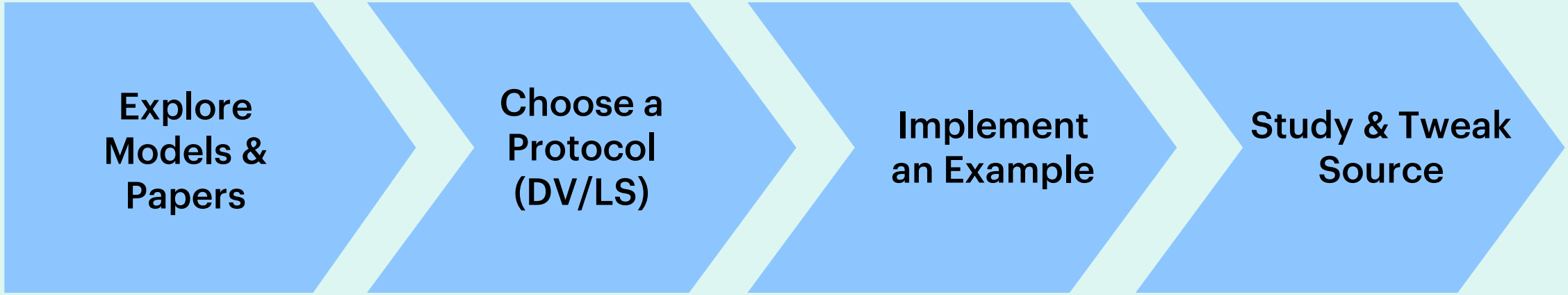
- More inspection needed

Files

```
global-route-manager.h
global-route-manager.cc

global-route-manager-impl.h
global-route-manager-impl.cc
(2209)

ipv4-global-routing.h
ipv4-global-routing.cc

ipv4-routing-protocol.h
ipv4-routing-protocol.cc

+ more files
```

src/internet/model

Next Steps


Explore Models & Papers
Choose a Protocol (DV/LS)
Implement an Example
Study & Tweak Source

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