Basic Network Kung-Fu: Essential Packet Processing Tools

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Outline

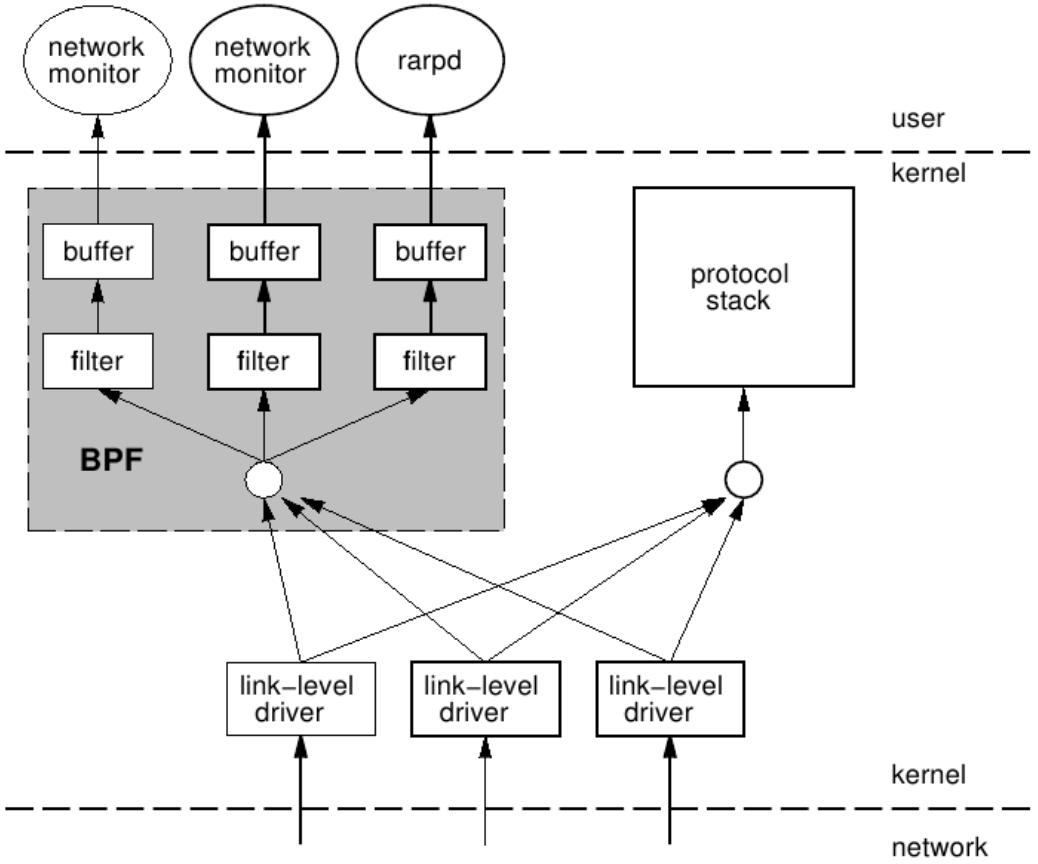
- Classes of packet processing tools
- New toys!
  - BPF, libpcap, tcpdump
  - Wireshark
  - Netdude
  - Click
- There are lots more
  - Often ad-hoc and purpose-specific
  - Reflects experimental nature

Classes of packet processing tools

- Sniffing & recording
  - Crucial for reproducible experiments
- Rendering & visualization
  - Crucial for understanding what's going on
- Filtering, Processing & Editing
  - That's Where all the action is
- Injection
  - Crucial for live environments

Sniffing: **Berkeley Packet Filter** (BPF)

- De-facto standard for grabbing packets



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  - a pointer to the raw data:

```
u_char *
```

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- **tcpdump** is a user-level tool for capturing and recording packets
- Supports complex network and transport-level filtering, translated into BPF expressions
- Can also read recorded traces and `stdin`
  - This enables *stream processing*
- `http://www.tcpdump.org`

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- Additional tools included (**tshark** in particular)
- `http://www.wireshark.org/`

Editing & Visualization: **Netdude**

- Sometimes tcpdump is not enough
  - cannot modify packets
  - stream model not always adequate
- Developed to facilitate IDS evasion testing
  - currently purely trace-based
- Netdude provides
  - a plugin framework for packet processing
  - command line and graphical interfaces
  - smart memory usage
- `http://netdude.sourceforge.net`

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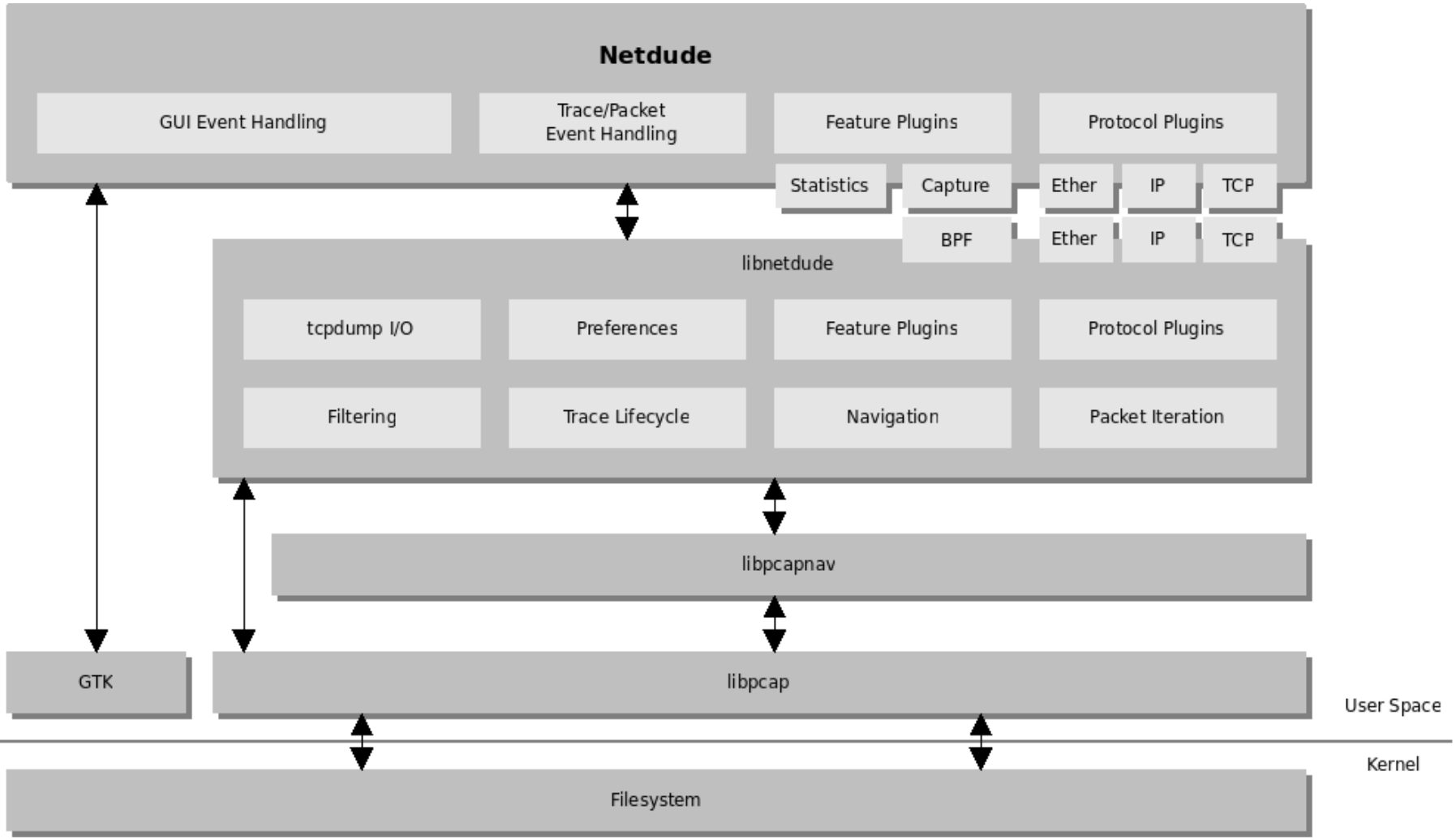

Sniffing, Processing, Injection: **Click**

- Build your own packet processing engine
  - Very popular in the research community
- Originally meant as a routing platform
- Idea: “click” functional modules together
  - Lots of these exist – NAT, measuring, queueing, recording, ...
- Supports live and recorded traffic
- Similar to Bro in some design aspects
- `http://www.read.cs.ucla.edu/click/`

Recommended Reading

- *Security Power Tools*, O'Reilly
- *The Tao of Network Security Monitoring*, Addison/Wesley