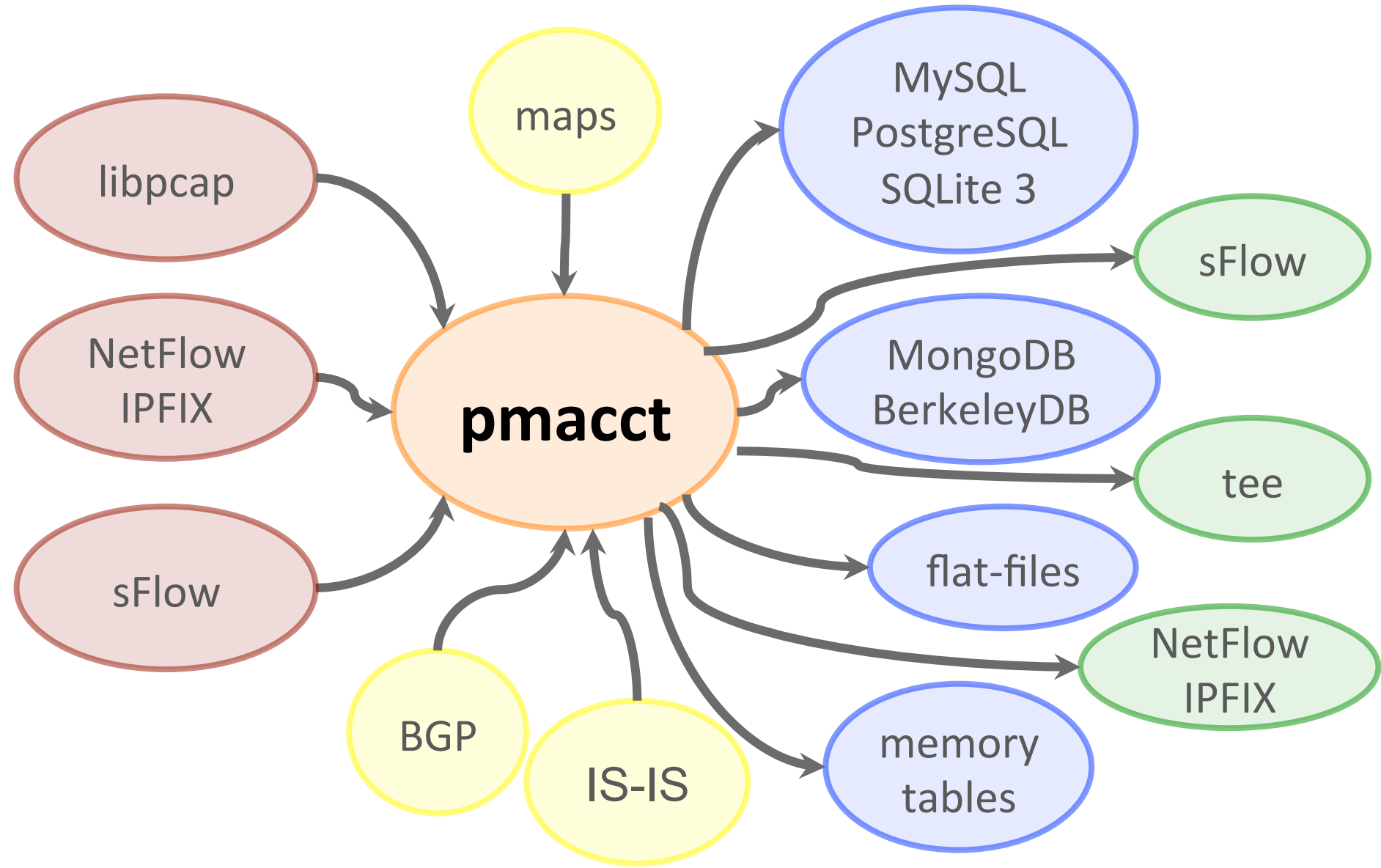# pmacct: a free open-source traffic accounting tool
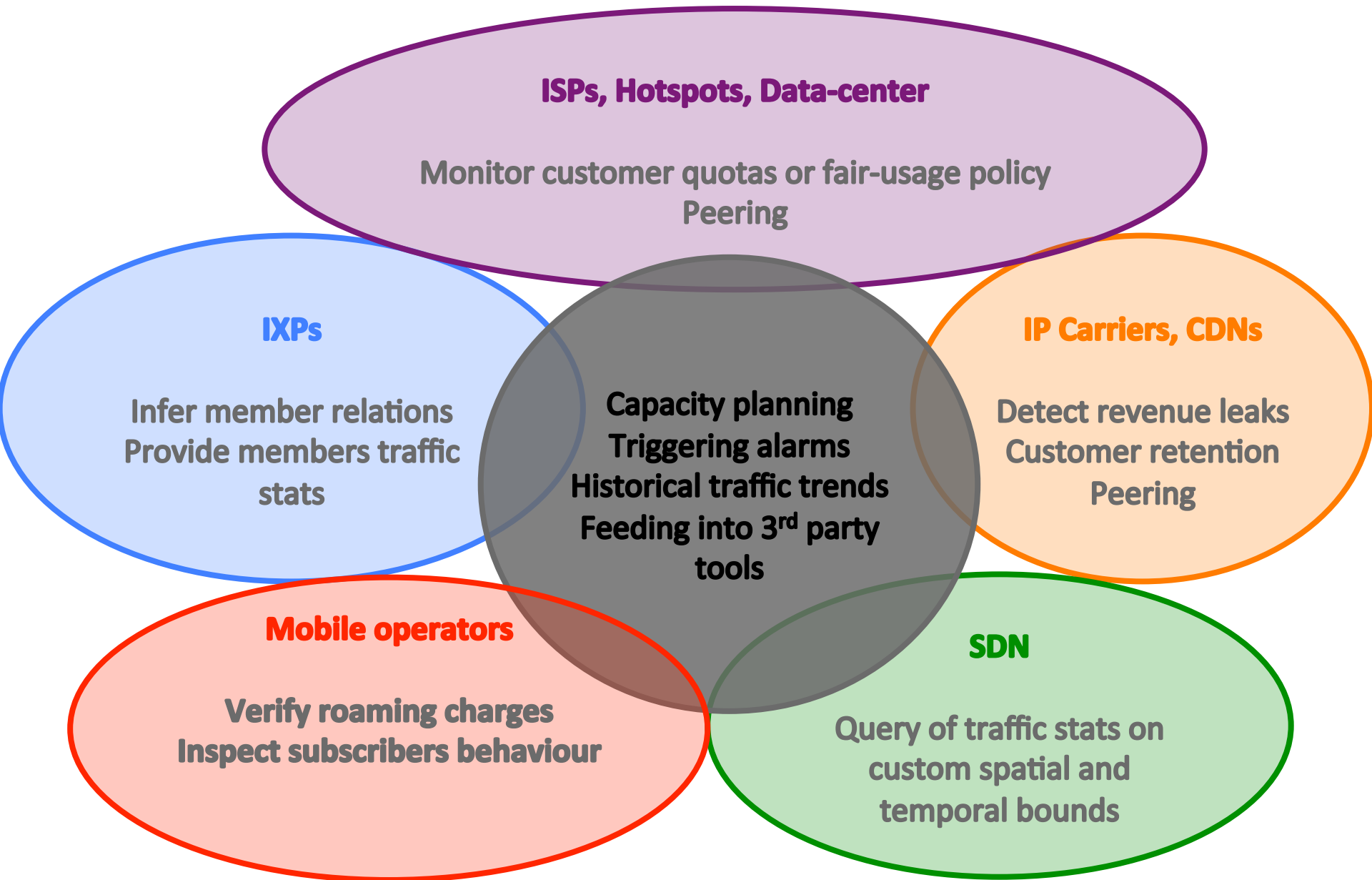
Paolo Lucente

pmacct

pmacct is free open-source GPL'ed software

Key pmacct non-technical facts

- A name you can't spell after the second drink
- Nearly 10 years old project
- Free, open-source, independent
- Under active development
- Innovation being introduced
- Well deployed around, also large SPs
- Aims to be the traffic accounting tool closer to the SP community needs

Usage scenarios

ISPs, Hotspots, Data-center

Monitor customer quotas or fair-usage policy
Peering

IXPs

Infer member relations
Provide members traffic stats

IP Carriers, CDNs

Detect revenue leaks
Customer retention
Peering

Capacity planning
Triggering alarms
Historical traffic trends
Feeding into 3rd party tools

Mobile operators

Verify roaming charges
Inspect subscribers behaviour

SDN

Query of traffic stats on custom spatial and temporal bounds

Some technical facts

- Pluggable architecture

  - Straightforward to add support for new collection methods or backends

- An abstraction layer allows out-of-the-box any collection method to interact with any backend

- Both multi-process and (coarse) multi-threading

  - Multiple plugins (of same or different type) can be instantiated at runtime, each with own config

BGP integration

- A Quagga-based BGP daemon was introduced:
  - Implemented as a parallel thread within the collector
  - Doesn't send UPDATE messages whatsoever
  - Behaves as a passive BGP neighbor
  - Maintains per-peer BGP RIBs
  - Supports 32-bit ASNs
  - Supports both IPv4 and IPv6
- Joins NetFlow (or sFlow) and BGP data basing on:
  - NetFlow source address == BGP source address

BGP integration (cont.d)

– Relevant implementation details:

- Bases on trust: peers are not defined but a max number of peers who can connect is defined instead

- Ensures iBGP peering by presenting itself as part of the AS of the neighbor, as read in the OPEN message

- Enables the following traffic aggregation primitives: AS path, Local Preference, MED, Peer ASNs (freely mixed with origin ASNs), Communities, Peer IPs

– Caveats:

- BGP multi-path is not supported

IS-IS integration

– A Quagga-based IS-IS daemon was introduced:

- Implemented as a parallel thread within the collector

- IS-IS neighborship over a GRE tunnel

- Currently limited to single neighborhip, single level, single topology

- Useful to look up non BGP-routed networks

- Promising, many plans:

    - Implement a non real-time, IGP-protocol agnostic version

    - LFA kind of computations

    - Collecting feedback on interest about TRILL

MongoDB plugin

– pmacct opening to noSQL databases

– noSQL landscape difficult to move through, ie. fragmented and lacks of standardization

– MongoDB seemed interesting for:

  ▪ Its native grouping operation (more performing and less complex than map/reduce)

  ▪ Its horizontal scaling concept (called sharding)

– Currently collecting feedbck: some preliminar testing at one large operator looks promising ..

GTP integration

- Decoding and correlation of GTP-C and GTP-U messaging:
  - Based on libpcap or IPFIX (own implementation)
  - Applications:
    - A peak into subscribers behaviour
    - Verify roaming charges
  - Currently in evaluation at a couple mobile operators (and developed in cooperation with one of them)
  - Code is not for general availability yet but it's free: if you are a mobile operator and are interested or have feedback, get in touch!

Further information

- http://www.pmacct.net/lucente_pmacct_uknof14.pdf
  - The case of the peer source ASN primitive
  - Entities on the provider IP address space
  - Auto-discovery and automation
- http://wiki.pmacct.net/OfficialExamples
  - Quick-start guide to setup a NetFlow/sFlow+BGP collector instance
- http://wiki.pmacct.net/ImplementationNotes
  - Implementation notes (RDBMS, maintenance, etc.)

pmacct: a free open-source traffic accounting tool

Thanks for your attention! Questions?

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http://www.pmacct.net/

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