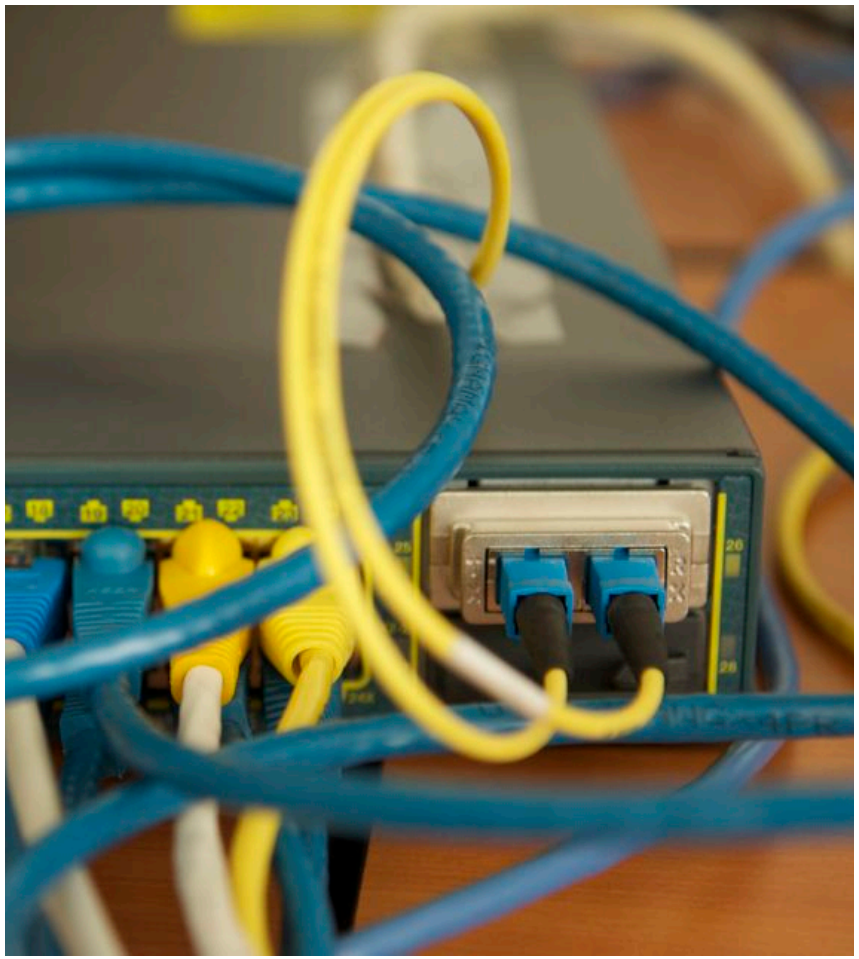
DEMONS IPFIX Interoperability Event - Final Report

CESNET, Prague, CZ
25-26 March 2011

Test Setup

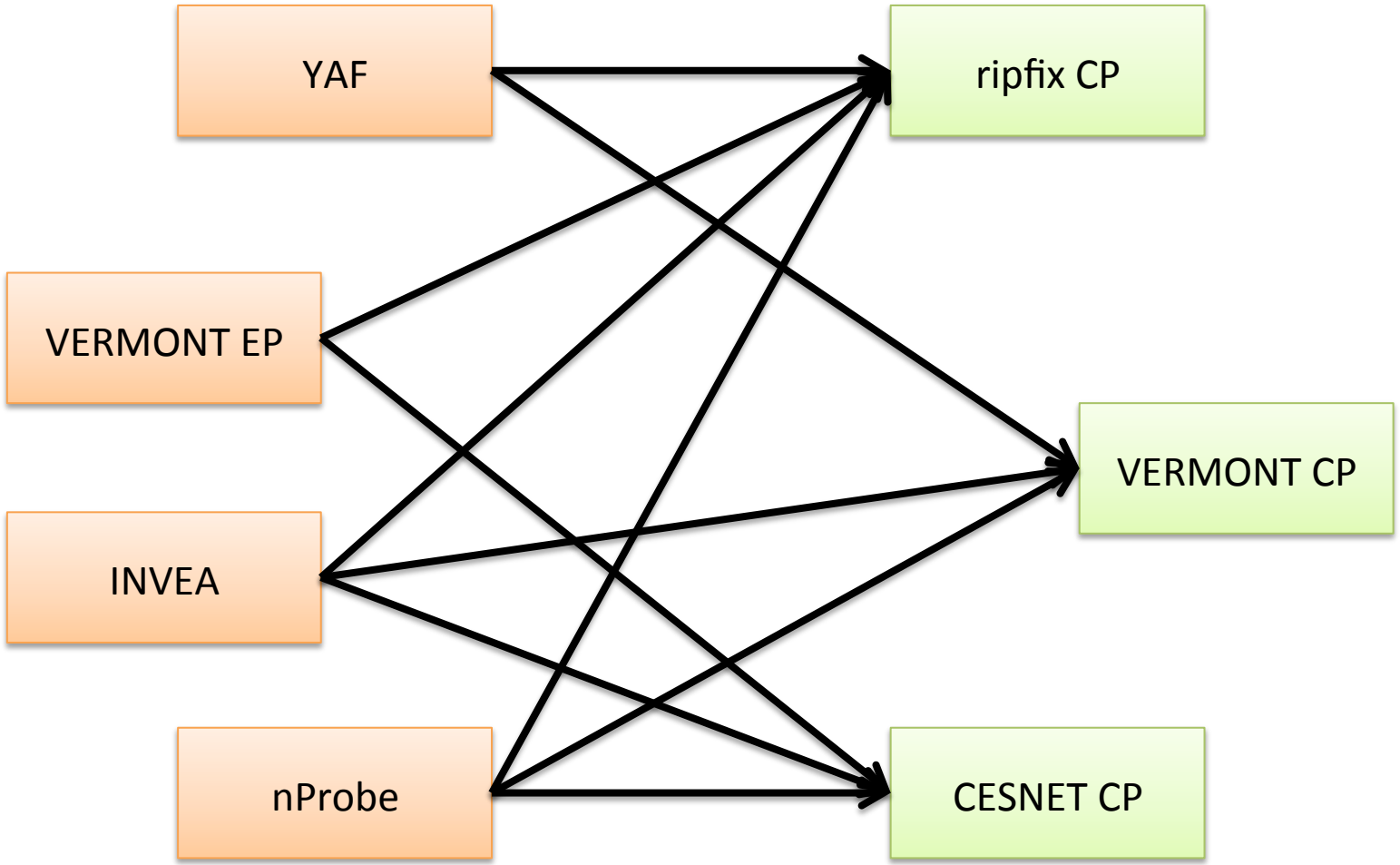


- Testing over two days at CESNET in Prague
- 1Gbit/s test traffic for MPs to observe
  - First IPFIX interop with realistic loads
- Tests of SCTP, TCP, UDP
  - connectivity from EP to CP
  - Template Record export and interpretation
  - Data Record export according to templates

Participants

- CESNET
- INVEA-TECH
- TU Munich (VERMONT)
- TU Kosice
- CERT/NetSA (YAF, SiLK)
- nTop.org (nProbe, nTop)
- ETH Zurich (ripfix)
- Cisco Systems* (PSAMP only)
  - *via replayed pcap

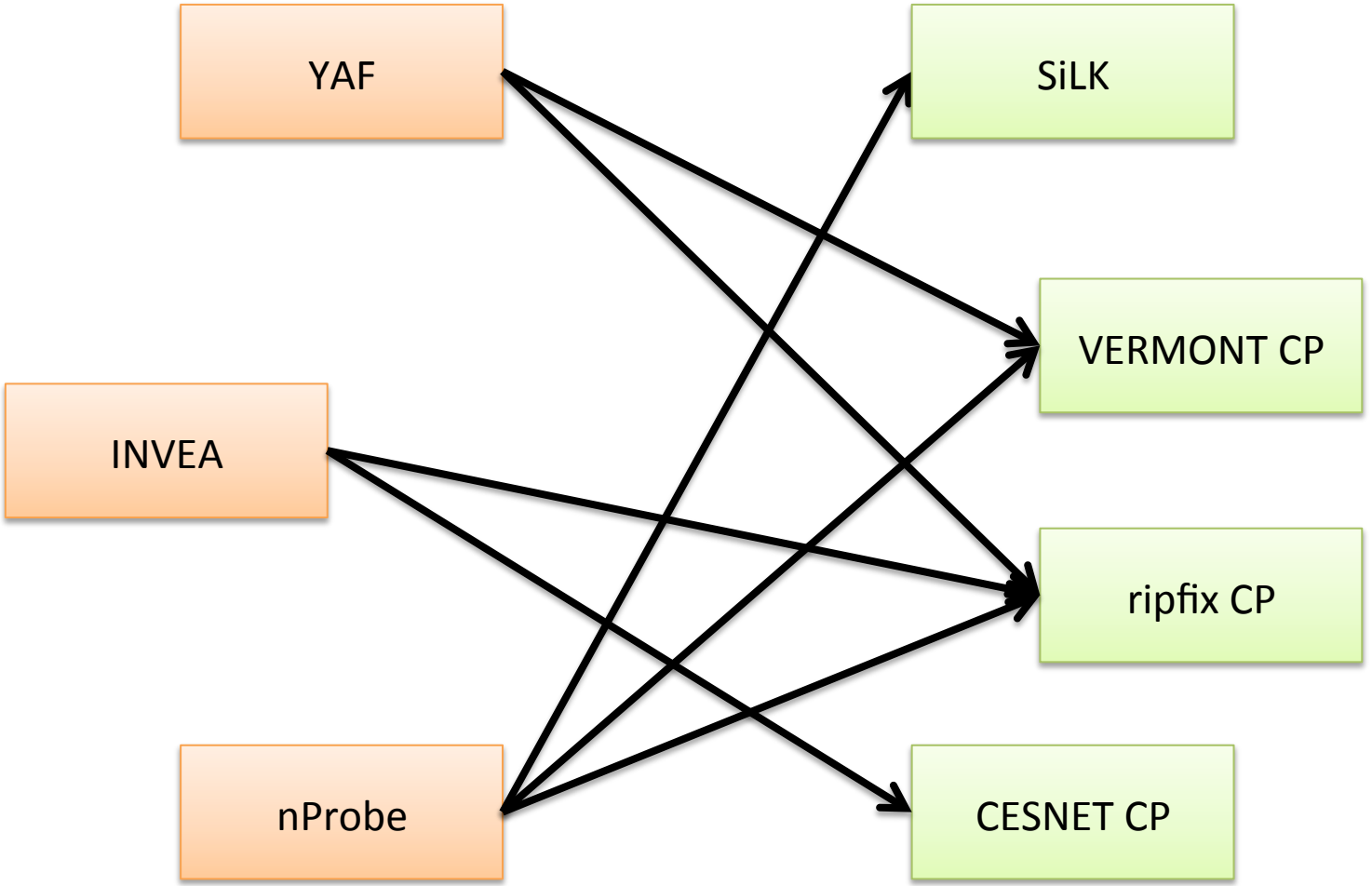
SCTP matrix



SCTP Issues

- Simple export works, as long as SCTP itself works
- Supporting kernel modules and libraries still somewhat temperamental
  - Much SCTP testing done virtualized
  - Some libraries/kernel modules have an apparent max SEQPACKET size of 62420
  - Some tests cancelled due to connection problems
- No implementation of multiple-stream export or exotic template handling

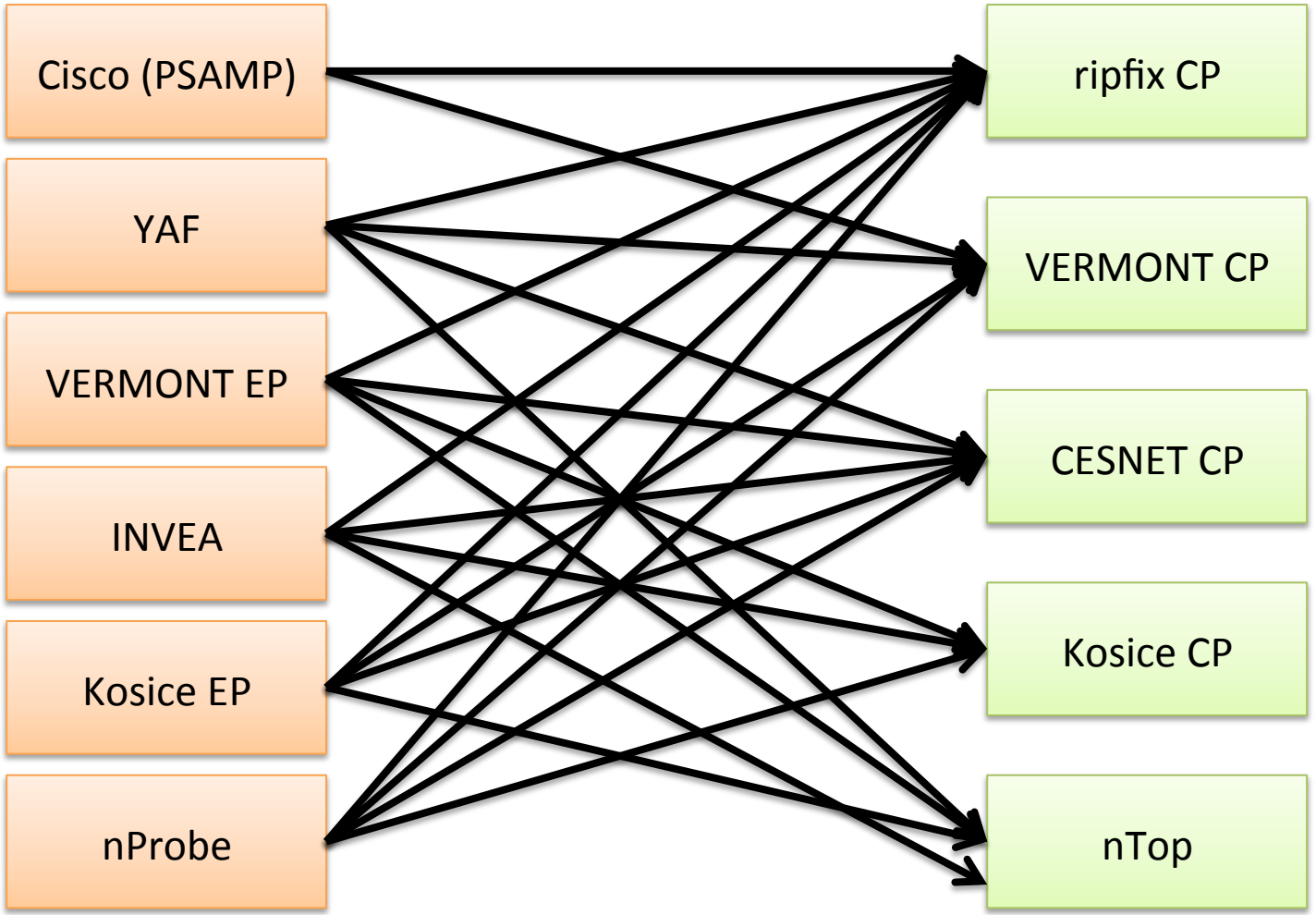
TCP matrix



TCP status

- Continued implementation-level faults need more debugging
  - Some prerelease implementations failed and were only partially tested, or completely removed from testing
  - One implementation corrupted export after large data volumes on TCP only.
- TCP not very widely implemented

UDP matrix


Cisco (PSAMP)
YAF
VERMONT EP
INVEA
Kosice EP
nProbe
ripfix CP
VERMONT CP
CESNET CP
Kosice CP
nTop

UDP issues

- UDP support most mature
  - reflects migration from NetFlow v9
- Serious packet loss on test network
  - up to 90% for slow collectors
  - emphasis on using a well-provisioned, dedicated, separated measurement network for UDP still a good idea
- Otherwise, few issues

General issues

- Enterprise-specific Information Elements and Reduced Length Encoding
- 64-bit IEs on 32-bit machines: implementation issues with 64-bit cleanliness
- Timestamp encoding (especially NTP)
- Synchronization of template retransmit and expiry on UDP caused confusion
  - suggest simplification of the rules

Partially tested

- IPFIX Files
  - supported for debugging by certain implementations
- IPFIX Structured Data
  - Verified that noncompliant collectors can successfully ignore structured data, as designed (YAF → ripfix)
- Export over IPv6
  - Some implementations dual-stack, but many still v4-only
  - Transport session management changes may be required for larger addresses, especially for UDP
- PSAMP
  - replayed UDP packets from a prerelease Cisco implementation were partially decoded by VERMONT and ripfix
  - discovered issues with template export, now fixed.

Not tested

- DTLS
  - Very limited support, even five years later
  - FreeBSD only, openSSL patches…
  - see http://tools.ietf.org/html/draft-mentz-ipfix-dtls-recommendations-02 for details.
- Multiple stream export or SCTP-PR
  - SCTP is basically a direct port from UDP for most
- Template withdrawal, stream separation, reuse
  - Is template handling needlessly complicated?

Acknowledgments

- FP7-DEMONS, sponsor
  - http://fp7-demons.org
- CESNET, facility and network
  - http://www.ces.net
- IPFIX implementors who brought code and devices to test