

The fbCAPTURE framework is a combination of FPGA firmware and a software API in C that utilizes the full potential present in a range of FPGA based network interface cards from Silicom. For wider support and ease of integration support for DPDK, PF_RING and libPCAP is included.

The fbCAPTURE cards are designed with a combination of a powerful FPGA and large amounts of high speed on-board memory to ensure zero packet loss even at line rate performance. The fbCAPTURE API is common for all the capture cards at 1GE, 10GE, 25GE, 40GE and 100GE link speeds. This simplifies system integration greatly, as support for multiple network speeds can be achieved with the same integration efforts.

SOFTWARE API

- Same API for all Silicom capture cards
- Support for HW accelerated DPDK, LibPCAP and PF_RING and nTop suite
- C based API (DLL/Shared library)
- Linux supported
- Multi Channel Direct Memory Access streaming (DMA) to Packet Ring Buffers (PRB)
- Up to 64 channels to host RAM
- 255 channels for packet transmit
- User error handlers
- No additional SW library dependencies
- SW development and integration tools

SERVER LOAD BALANCING

- Host server traffic load balancing
- Up to 64 channels to multiple host processes' memory
- Selective traffic redirection
- Load balancing to external hosts via optical Tx interfaces, incl logical channels
- Dual level load balancing. Hosts & CPUs
- Duplicate packets to multiple channels
- Distribution without CPU overhead using 2, 3, 5 and N tuple hashing or filter rules
- Cross-probe hash fraction distribution
- Custom hashing

SUPPORTED HARDWARE

- Silicom cards for 1, 10, 25, 40 and 100 Gbit/s using pluggable transceiver modules (SFP, SFP+, sfp28/QSA28 QSFP+, QSFP28)
- Ethernet PHY embedded in FPGA for full packet control
- PCIe Gen1, Gen2 and Gen3 support for optimal host throughput
- Monitoring via SPAN port/optical taps
- Ethernet auto-negotiation
- Limitless Daisy Chaining of monitored optical fibers between cards, at full signal strength, reducing number tapping of points
- Board to board interconnect for data merge and redirection
- Jumbo & undersized packet support

FILTERS

- A wide range of inline filters can be defined and combined in real-time to meet a variety of filtering requirements on a wide range of protocol header parameters
- On-the-fly reconfiguration of filters
- Filter types available include ranges, pattern match, fixed/dynamic offset and value, bit masks and value, true/false, not, hash values, compounds and more on e.g.:
 - Link layer: ARP, Tunnels (L2TP), MAC, VLAN incl. Stacked VLAN, MPLS, etc.
 - Internet layer: IPv4, Ipv6, ICMP, RIP, OSPF, ECN, etc.
 - Transport layer: UDP, TCP, SCTP, etc.
 - Application layer: HTTP, FTP, LDAP, POP, RTP, SIP, SMTP, Telnet, GTPv1, GTPv2, SIGTRAN, GTP-U payload headers incl tunneled load balancing etc.
 - Optional on-wire error and undersized frames to processing and capture

PACKET SLICING

- Slicing rules can be applied to conserve memory and storage by truncating packets
- Fixed length slicing
- Dynamic slicing, where truncation may start at offset from any specified header and include user definable number of bytes thereafter

PACKET DESCRIPTOR

- Captured packets can be enriched with descriptors generated by the adapter at line rate.
- PCAP Descriptor
- Standard Descriptor
- Multiple Extended Descriptor
- Multiple time formats supported

PACKET PROCESSING

- Zero copy PDU handling
- Packet indexing of protocol layers
- No protocol parsing needed for access to individual layers
- Optional insertion of time alignment ticks (packets) in host memory buffer every 100ms/1s
- Optimized packet transfers for batch processing
- Packet batching based on time or batch size
- API supplied parsing code

DEDUPLICATION

- Removal of duplicated packets
- Configurable duplication detection parameters

IP DEFRAGMENTATION

- IP fragments are correlated on-the-fly and processed as the initial fragment of the original packet
- Correlated fragment handling ensures that all related fragments are delivered to same channel as specified for the complete original packet
- True representation of on-wire packets

NETWORK STATISTICS

- Elaborated subset of RFC2819 RMON1
- Periodic statistics for each interface
- Counters for special purpose firmwares
- Network counters include: number of octets, CRC align errors, undersize packets, oversize packets incl. Jumbo frames, packet size distribution & more
- Provided via API or via supplied independent Silicom application

ON-BOARD SENSOR READINGS

- Temperature with preset minimum, maximum card operating temperature
- Optical signal level readings
- Link status
- HW status validation

Silicom Capture Card

