# CUBRO
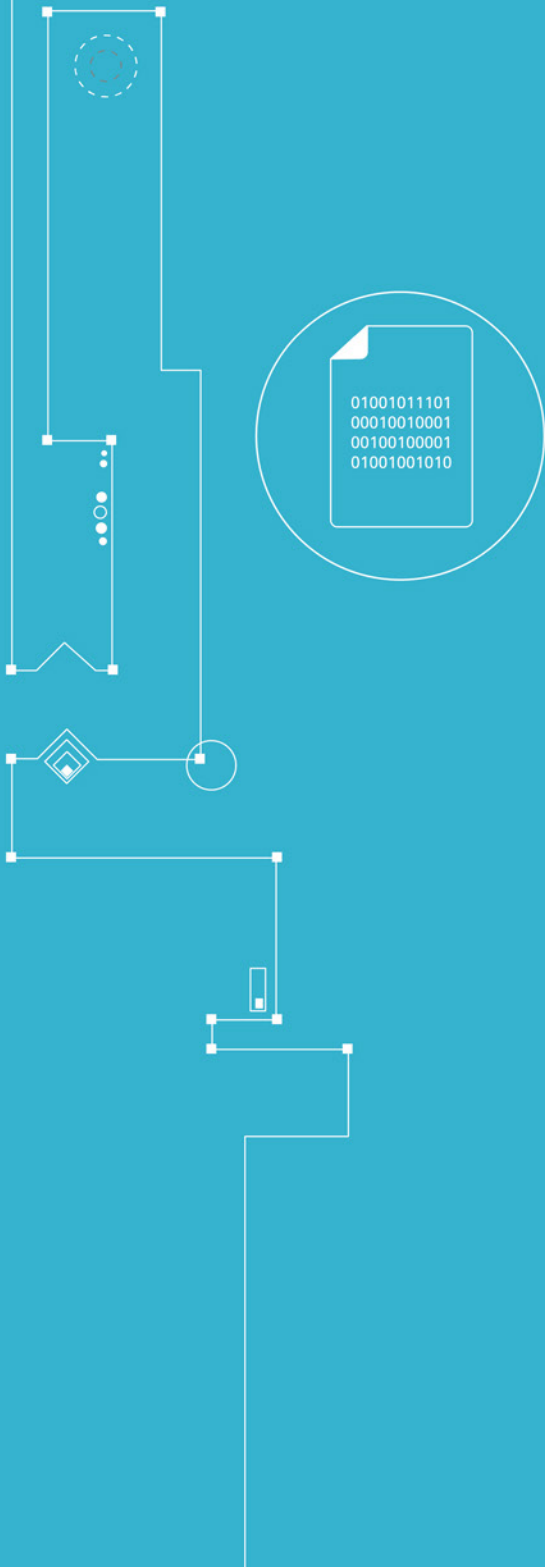## NETWORK VISIBILITY

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# MOBILE PROBE SERIES

## DATA SHEET

# Network Probe
## At a glance

### Definition

A probe is a passive device which receives network traffic from TAPs and network packet brokers and extracts metadata .

### Advantages of Cubro Probe

- Small foot print
- Low power design
- Embedded Network Processor design
- Can be customized to customer's requirement
- XDR export via UDP stream
- Support of any kind of SFP and SFP+ (also 10 Gbit BASE_T), and QSFP
- 24 x 10 Gbit and 4 x 40 Gbit

## Product Review

Cubro delivers the new generation big data intelligent probe series products in order to meet the demands of the operators and fast developing networks. The probe is based on the industry-leading MIPS multi-core architecture. The Probe can process and analyse control plane and userplane traffic in real time. It has ultra high port density, great processing capability, ultra low power consumption and visual interface. The Probe can improve the network quality, promote the user perception and strengthen the information security.

## Functions/Benefits:

- The operating system developed by Cubro for signaling decoding and network protocol analyzing is based on the Network Protocol Analysis System (NPAS). The Probe can identify and analyze over a thousand traditional applications protocols and various new ones. Besides, the Probe can correlate and analyze signaling messages in mobile core networks and generate XDRs, providing the basis for application analysis and thus helping network owners to construct the intelligent network pipeline which can be identified, localized and analyzed. It has ultra strong processing capacity and ultra low power consumption with MIPS multi-core CPU.

- The Probe can make typical traffic processing such as packet integrity preserving, packet decompressing, keyword matching and session management with hardware. It provides the processing capacity as high as 20 Gbps and power consumption as low as 160 W in 1 U compared with traditional devices. It can provide 200% traffic processing capability with only 20% equipment size and power consumption, making it simple to conduct the big data analysis in real time.

# Product Capabilities / Features

| | |
|---|---|
| Identification Feature | Supports 2G/3G/4G mobile core network WLAN MAN interface connection, signaling analysis of GPRS/UMTS/CDMA2000/LTE and business analysis inside MPLS, PP2P, GTP, GRE, IPoverIP, VLAN and PPPoE. |
| Supported Interfaces | Gn: GTP-C; Gb: BSSGP/GMM/SM;<br>IuPS: RANAP/GMM/SM;<br>LTE S1-U/S1-MME; LTE S11/S12: GTP-C (V2.0);<br>LTE S6a/Gx/Rx: Diameter; Gi: Radius; R-P: A10/A11. |
| Other DPI Features application detection | Up to 1000 applications are supported today |
| LTE Signaling Decryption | LTE S1 NAS |
| Classification | 6-tuple ACL rule (IP 5-tuple + app id, maximum: 4K)<br>Redefining app id with actions to classify applications<br>Load balancing (preserving session/subscriber integrity) |
| XDR | Generating XDRs in Cubro format as UDP stream |
| Real-time User Tracking | Tracking the user in real time with phone number, IMSI and IP; generating CDR, CDR rate 1 CDR per/sec |
| Online Session Memory | 200 - 400 million simultaneously can be handled per probe |
| Ports | 24 X 10 Gbps / 1 Gbps and<br>4 X QSFP 40 Gbps |
| Configuration / Communication | Serial/SSH/Telnet/FTP |
| Performance | Throughput 160 Gbps<br>DPI Performance 20 - 60 Gbps<br>20 million concurrent sessions online (max) |
| CPU | Mips 6496 Core |
| MTBF | 178,125 hours |

# Product Internal Function
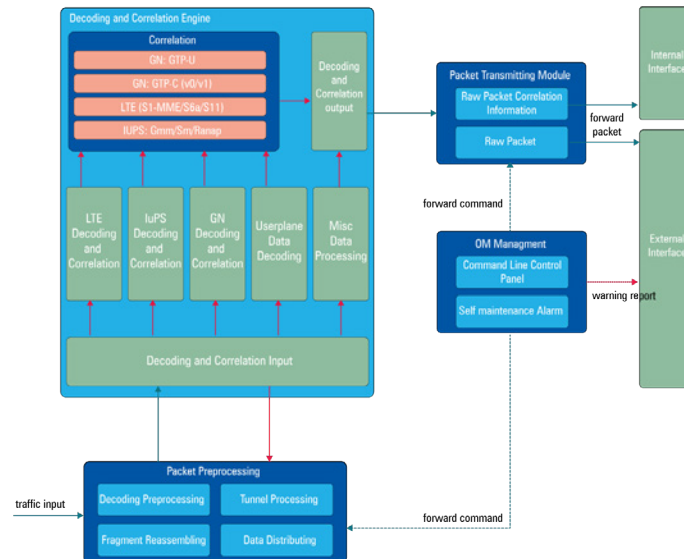


- The packet preprocessing module is composed of four parts: decoding preprocessing, IP fragments reassembling, tunnel processing and data distributing.
- In decoding preprocessing process, the probe mainly checks the data correctness, fragment identifier and decodes the IP/TCP/UDP/SCTP layer.
- In IP fragments reassembling process, the probe reassembles the IP fragments. When some fragments are lost, other fragments of the packet should be output to the main system for statistics accuracy. If the first fragment is lost, other fragments of the packet will not be correlated and there are only public fields on CDR. If all the fragments except the first one is lost, the first fragment will be correlated and it will be shown in the CDR that some fragments are lost.
- In tunnel processing process, the probe preprocesses the Gtp-C, Gtp-U, GB signaling and IuPS signaling decoding, distinguishes the main signaling interfaces and extracts some public fields.
- In data distributing process, the probe identifies different interface data types based on the IP table of GGSN, different interfaces and directions (up link or down link). Different data types from different interfaces will be forwarded to corresponding modules to be further processed.
- Decoding and Correlation Engine - The decoding and correlation engine is responsible for decoding and composing different signaling: Gn: GTP-C; Gb: BSSGP/GMM/SM; IuPS: RANAP/GMM/SM; LTE S1-U/S1-MME; LTE S11/S12: GTP-C (V2.0); LTE S6a/Gx/Rx: Diameter; Gi: Radius; R-P: A10/A11.
- Besides, the information about the user identification, location and business (such as IMSI, UserIP, LAC and APN) can be obtained by looking up the PDP table. However, the engine can only process the GTP-U data of Gn instead of Gb or IuPS.
- Packet Forwarding - There are two packet forwarding ways:
  1. The forwarding way of packets with information structure - It is used for the communication of the front end subsystem to the main system. The information, which contains header and body, is after the raw data. The information header contains interface version, information length, raw data length, belonging interface

and direction (up link or down link). The information body contains CDR or PDP information.

2. The forwarding way of raw data - It is used for internal debugging or other functional requirements.

• OM Management

1. Command line control panel - It is used for managing and configuring the basic parameters forwarding configurations of the front-end subsystems and checking the system status statistics information.

2. Self-maintenance alarm - The device will notify the maintenance engineers of the device state by alarms, such as the port state and processing capacity.

# Technical Data / Specifications
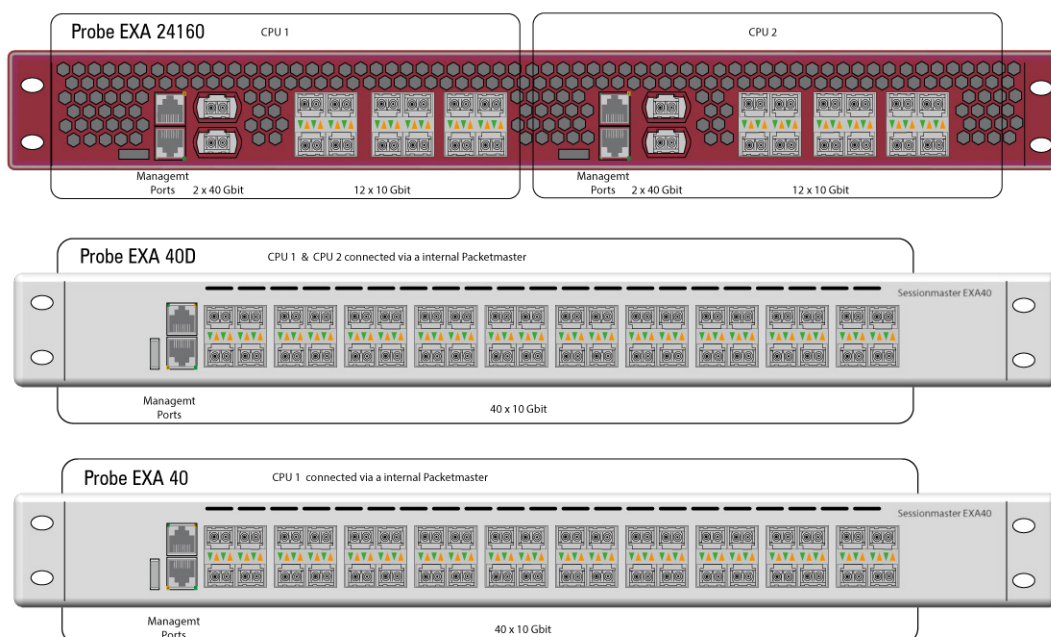


## Inputs*

Several 1, 10, 40 Gbit interfaces can be used as inputs from TAPs or NPB.
On EXA40 and EXA40D a NPB is build in the probe.
On EXA24160 an external NPB can be used for load balancing the traffic.

## Outputs*

Any port can be used as metadata streaming output. The XDR's can also send load balanced traffic over several ports to reduce the load on the servers.

## Performance

Nearly more than 1000 pre configured fingerprint application id available.
Advanced multi core CPU design
Lowest power usage per Gbit traffic processing in the industry.

## Management

Management Port: (1)
 RJ45 10/100/1000 Mbit
Configuration (CLI) Port: (1) RS-232 DB9
USB 3.0 for software update

## Indicatiors

Per RJ45 port: Speed, Link/ Activity
Per SFP+ port: Status, Rx, Tx, Link
Per Device: Power, Status

# Available Probe units

| Product Type | | Probe EXA40 | Probe EXA40D | Probe EXA24160 |
|---|---|---|---|---|
| Hardware specs | Monitoring Ports | 40 x 10 Gbit SFP+ | 40 x 10 Gbit SFP+ | 24 x 10 Gbit & 4 x 40 Gbit |
| | Management Ports | 1 x RS 232  RJ45 & 1 x FE RJ45 & USB 2.0 | | |
| | Memory | 64G DDR3 1333MHz ECC | 128G DDR3 1333MHz ECC | 128G DDR3 1333MHz ECC |
| | CPU | Cavium MIPS multi-core processor | Cavium dual MIPS multi-core processor | Cavium quad MIPS multi-core processor |

| Features | Network and Interface Connection | GPRS UMTS: Gb/IuPS/Gn/Gi<br>CDMA2000 1X EVDO: RP/Pi<br>LTE FDD TD-LTE: UU(software collection)/X2(software collection)/S1-MME/S1-U/S11/S3/S4/S5/S8/S6A/SGs/SGi WLAN<br>IP network: TCP/IP; managing the ID information by Radius | | |
|---|---|---|---|---|
| | Mobile Network Signaling Protocol (with CDR) | GRPS: GMM/SM/BSSGP/SNDCP/GTP/RADIUS<br>UMTS: RANAP/GTP<br>CDMA2000 1X EVDO: A10/A11<br>LTE FDD TD-LTE: RRC/X2AP/S1AP/GTPv2/DIAMETER/SGSAP/EMM/ESM | | |
| | End-to-end Analysis of Signaling Business | Analyzing the user signaling and businesses to generate the CDR<br>which contains user ID, location and behavior, etc. | | |
| | Real-time User Tracking | Tracking the user in real time with phone number, IMSI and IP;<br>generating CDR | | |
| | DPI performance | 20 Gbps | 40 Gbps | 60 Gbps |
| | DPI Protocol Feature | 1200 Application Signature (can be extended to approx. 4000) | | |
| | Business Identifying Rate | >95% | | |
| | Business Identifying Accuracy Rate | >99% | | |
| | Identifiable Main Applications (expendable) | Instant Message WeChat, QQ,whats up,skype Payment (Alipay, Mobile Wallet)<br>Music (QQ Music, Baidu Music, KuGoo) Video Youku, Tudou , Youtube, Netflix , Amazon<br>Microblog (Sina Weibo, Tecent Weibo) HTTP Download (360 Application Asistant , Pea pods, Asistant 91) VOIP (Alicall, Skype  E-mail (163 postbox, QQ postbox)<br>Game Fruit Ninja, Legends of the Three Kingdoms<br>P2P Download (Thunder, eDonky) Operator Business (MMS, Mobile Newspaper)<br>Web Browsing (SINA, SOHO) Traditional Protocol (FTP, TELNET, DNS) | | |

# Typical Application
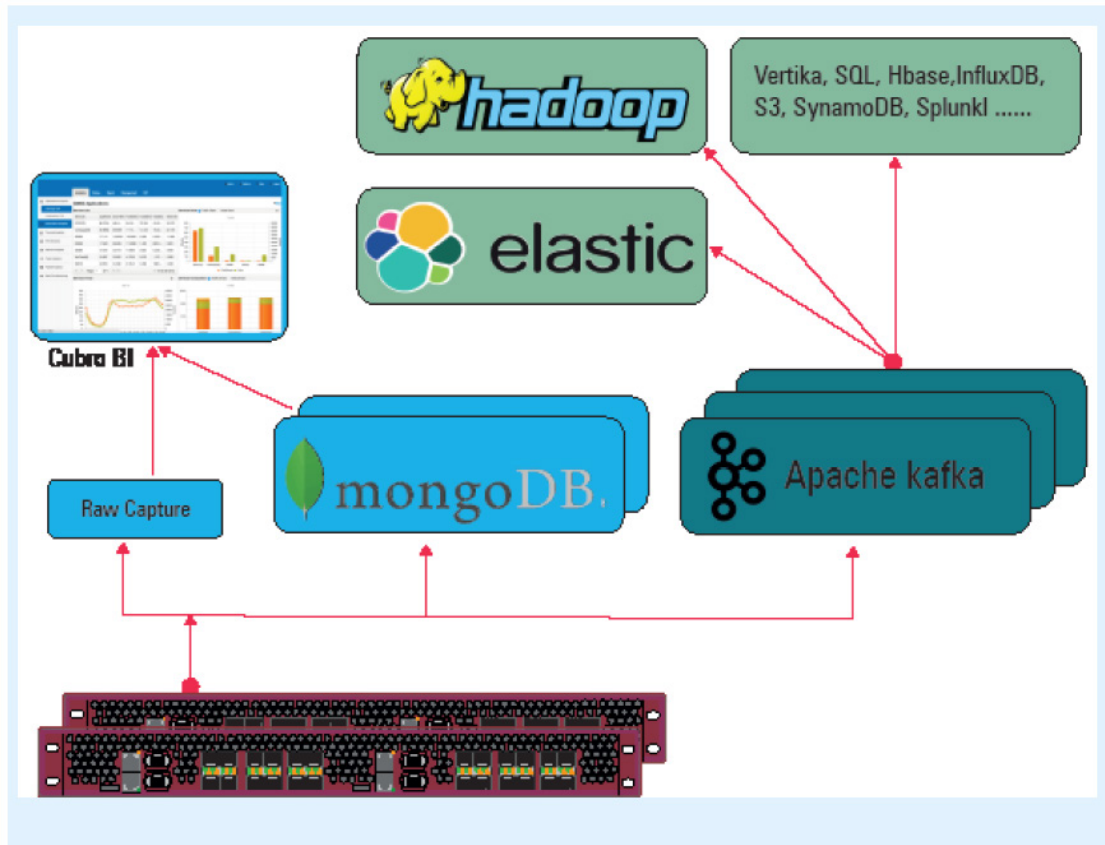


This is the Cubro Big Data approach. The Cubro Probe delivers the XDRs via UDP stream to Apache Kafka instances.

The Cubro Kafka extension makes it possible that Kafka can handle the Cubro XDRs and enrich, modify and convert the data into the requested format, depending on the customers need and the used BI system.

Cubro also offers a basic BI system based on Mongo DB. This also scales to large size, but is a closed system.

# Ordering Information

## Product Components:

- Cubro Mobile Probes
- AC/DC power supply
- European power cord
- (no SFPs included)

| Part Number | Description |
| --- | --- |
| CUB.PCP-Q | Packet Core Probe, quad CPU, AC power |
| CUB.PCP-Q-DC | Packet Core Probe, quad CPU, DC power |

For more information please check our website **www.cubro.com**.