

ADB is a one-stop shop offering innovative and high-quality full system solutions for content distributors, TV operators and property owners, who want to deliver best-in-class video and broadband services to their customers.

ADB combines innovation, software and hardware expertise with user expectations to provide reliable and fully integrated products with a guarantee of on-time deployment and long-term support.

The company is a valued partner of choice to service providers and operators around the globe. ADB's solutions empower the world's leading content distributors, Pay-TV and broadband operators.



epiCure suite is a complete family of solutions designed by ADB to help broadband and broadcast operators to enhance devices monitoring and diagnostic processes, reduce help-desk cost, monitor overall end-point devices health, set complex and correlated KPI, collect and analyze data metrics. The platform enables failure prediction and analytics of end-users' behavior. With one setup, the operator can run all services or start with one and then extend or shift to the other.

epiCure is a successor of field-deployed Trouble Shooting Suite (TSS) with several functional enhancements and a completely renewed architecture designed to deliver the highest degree of configurability and flexibility. ADB has developed epiCure to enable operators to further enhance the quality of their service.

epiCure pillars

HW agnostic

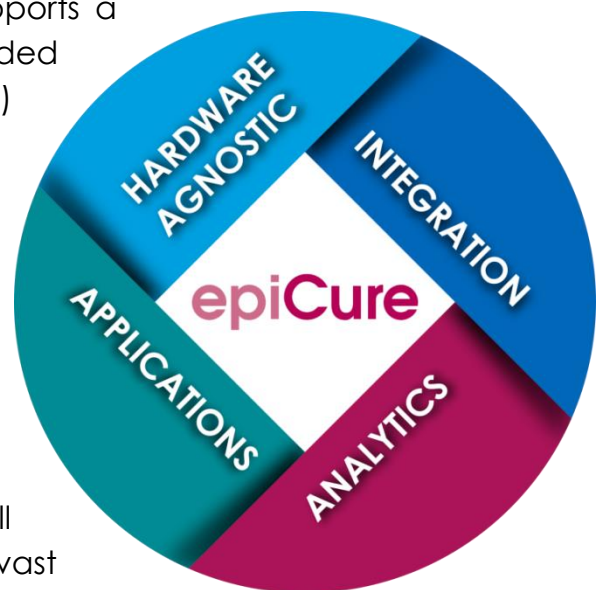
Leveraging Elasticsearch flexibility, **epiCure** supports a very rich set of input plugins additionally extended with TR-069, MQTT, and tools (i.e. QoE agent) that are applicable to both broadband and broadcast industries and enable monitoring and diagnostic of ADB and third party devices, reducing integration effort and time-to-market.

Integration

epiCure back-end is designed to operate from the cloud, in the operator's infrastructure as well as in cloud services like AWS. It supports a vast range of protocols and APIs to interface with end-point devices, existing operator's CRM and ACS systems.

Applications

epiCure offers a dedicated dashboard for flexible alarm configuration based on frequency and threshold logic. A graphic tool powered by Kibana allows to easily create custom dashboards, apply filters, zoom in/out, and generate heatmaps. Easy-to-use dashboard for "in-home" connectivity summary provides helpdesk with relevant data to increase efficiency and improve the end-user's experience.



Analytics

Embedded big-data inventory facilitates profound analytics in order to identify end-users behaviors, performance degradation, possible correlation between metrics and end-users experience. Collected information enables the operator to move from passive to predictive troubleshooting.

epiCure features

- **Silent monitoring**
epiCure enables silent monitoring by collecting massive amounts of metrics from large populations of devices, without interfering with normal operation
- **Real-Time computing**
Collected data is processed in real-time to raise alarms upon detection of anomalous conditions but also stored for further process and trend analysis
- **Multisource data ingestion**
Facilitates integration with multiple data sources beyond CPE, like CRM, SysLog, ticketing systems and with existing operator's provisioning systems
- **Diagnostic**
Execution of pre-built test (Web browsing and YouTube quality, Speed test, etc.)
Monitoring of pre-defined parameters and alert generation by head-end for proactive analysis and easier troubleshooting
Pre-defined alert categories (device, WAN, Wi-Fi, audio & video, etc.) to quickly isolate issues
- **Reporting**
Rich set of graphics and exportable reports (xml, xls)
- **Customizable visualizations – flexible graphic dashboards**
Highly customizable dashboard UI enables various and easy data consolidation and assisted interpretation of all collected information addressing needs of different audiences inside the operator's organization (help-desk, network engineering, product managers)

epiCure DEVICE VIEW GROUP VIEW **ALARM CONFIGURATION** ADMIN

Index

Alarms configuration

Search...

- Device - CPE management (Disconnected) Frequency
- Device - CPE management (Missing periodic inform) Frequency
- Device - CPE management (Reboot) Frequency
- Device - CPU IO wait Threshold
- Device - CPU load average last 15 minutes Threshold
- Device - CPU load average last 5 minutes Threshold

Name: CPE management (Disconnected)

Rule type: Frequency Rule area: Device

Rule status: Enabled Index pattern: ts-reports-metrics*

Filter: Please select query string

Num. of events: 1 Timeframe: 24

epiCure DEVICE VIEW GROUP VIEW ALARM CONFIGURATION ADMIN

Device view SEPTEMBER 7, 2018 - SEPTEMBER 21, 2018

DEVICE 68801T0000368

SUMMARY HOME NETWORK DEVICE **WI-FI** WAN VoIP

INTERNET INTERNET KEY FIREWALL 68801T0000368

UPTIME: 10D 19H 32M 17S CONNECTION UPTIME: 10D 19H 32M 18S LAST READ DATE: 2018-09-21 12:10:31

epiCure 5GHz (WPA2-Personal) 5GHz **ON** 2 hosts connected **SHOW**

epiCure 2.4GHz (WPA2-Personal) 2.4GHz **ON** No devices connected

Ethernet Philips-hue IP: 192.168.1.8 MAC: 00:17:88:2B:40:DA Vendor: Philips Lighting BV Address Source: DHCP **PING**

IP: 192.168.1.4 MAC: 68:63:59:0F:C7:91 Vendor: Advanced Digital Broadcast SA Address Source: DHCP **PING**

USB generic platform ehci controller Vendor: Linux 3.4.11-r19 ehci_hcd generic platform ohci controller Vendor: Linux 3.4.11-r19 ohci_hcd xhci host controller Vendor: Linux 3.4.11-r19 xhci-hcd xhci host controller Vendor: Linux 3.4.11-r19 xhci-hcd

epiCure DEVICE VIEW **GROUP VIEW** ALARM CONFIGURATION ADMIN

No devices connected SEPTEMBER 12, 2018 - SEPTEMBER 26, 2018

emb-rp-group-summary-dots

Group summary - HW version Alerts - by HW version

Group summary - SW version Alerts - by SW version

Alerts - by category

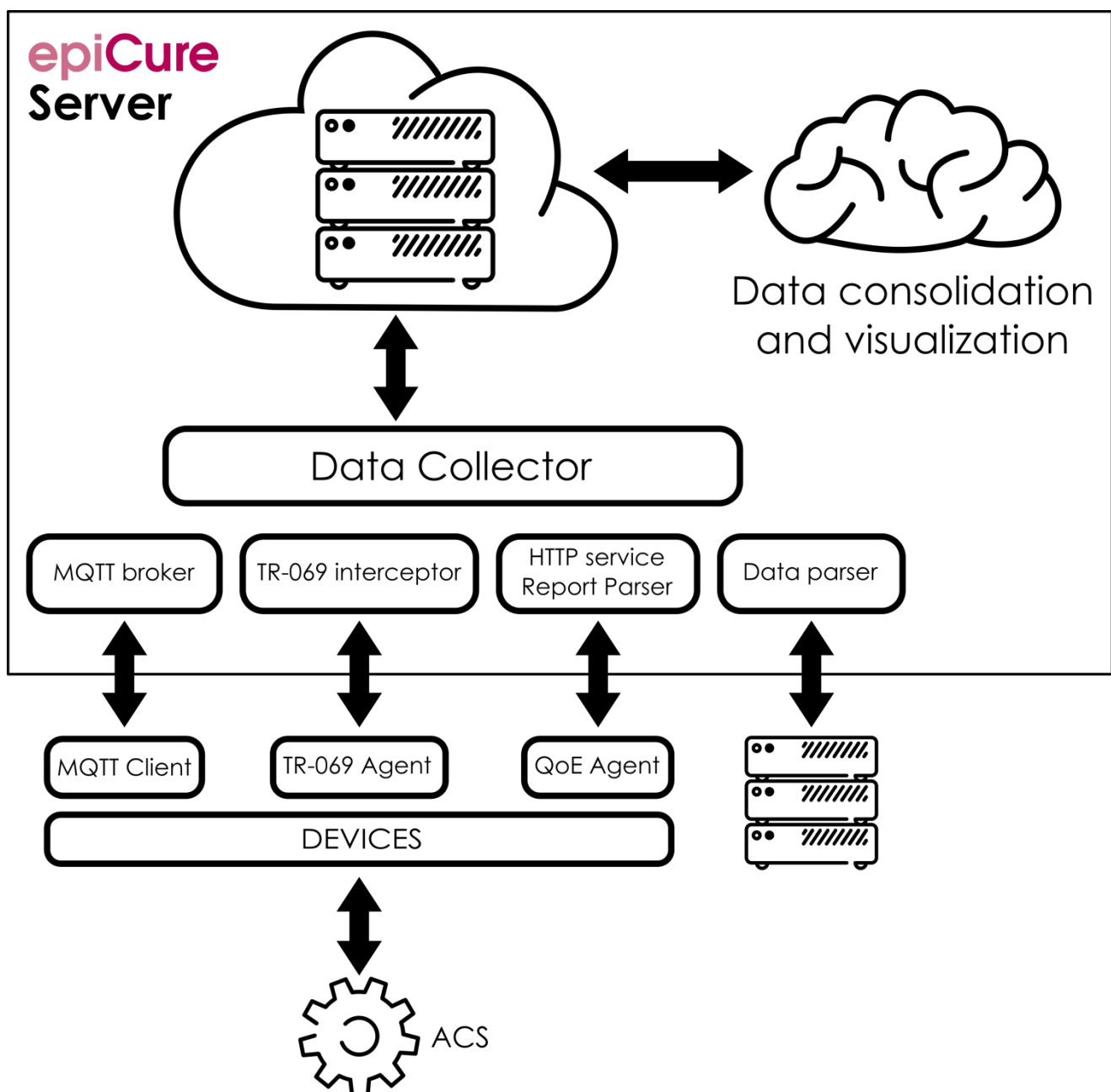
Alerts - by SW version

Alarm type heatmap

Alert Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CPE management (Missing periodic inform)	51	41	40	32	49	44	39	17												
CPE management (Disconnected)	32	19	26	27	21	27	13		6	35	30	27	25	33	7					
PING Test: Packet Loss	23	13	21	24	27	19	4		9	53	51	58	45	56	20					
Radio STA: all error rate (5GHz)	14	14	27	23	20	8														
Primary DNS response for internet connection	10					6							17	11	7	14	15			
Radio STA: all error rate (2.4GHz)	10												17	11	7	14	15			
Other	39	20	23	29	27	30	22	14	16	33	32	26	32	24	24					
Radio STA: all error rate (2.4GHz)		21	25	20	22	21	9													
PING Test: Response time		5	4					4	4	4										4
PING Test: Jitter																				4
WiFi connection for internet connection (2.4GHz)				8	6															5
WiFi connection for internet connection (5GHz)								4	3	3	5	5	5	5	7	4				5

Three main components of epiCure

- **Big-data inventory** – stores all information coming from data collector engine
- **Data collector engine** – encompasses all protocols and interfaces to external data sources
- **Data consolidation and visualization engine** – enables graphic, dashboard creation, analytics and reporting

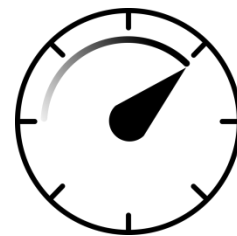


epiCure metrics

With epiCure, operators can track and monitor an extended set of parameters to provide the best quality of service. The troubleshooting management encompasses a set of pre-defined categories of issues common for both broadband and broadcast devices. Those categories apply to single device view as well as subgroups and entire devices' population.

WAN Performance and Stability metrics

- SNR Measurement
- PPPoE Dialer Disconnection
- WAN Ethernet Disconnection
- Speed Test results vs Sync Rate
- Ethernet/DSL Errors Monitoring
- Ping test (packet loss, response time, jitter)
- DNS response time
- Round trip delay



Wi-Fi metrics

- Access Point – Station packet errors rate
- Access Point – Station transmission speed
- SSID – Station packet errors rate
- SSID – Station transmission speed
- Radio channel changes
- Radio channel load
- Access Point signal strength



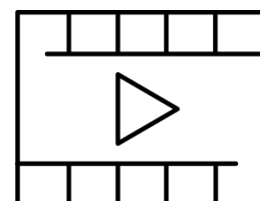
Device metrics

- System load
- Number of running processes
- Memory status
- Reboot and disconnections
- HW and SW version
- Manufacturer
- Heart beats



Video and Audio quality metrics

- Stream profile rate changes over time
- Video resolution
- Error generated per video component





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