witbe
Quality of Experience

MHz
MEGA HERTZ

Improve your
Quality of Experience

Agenda

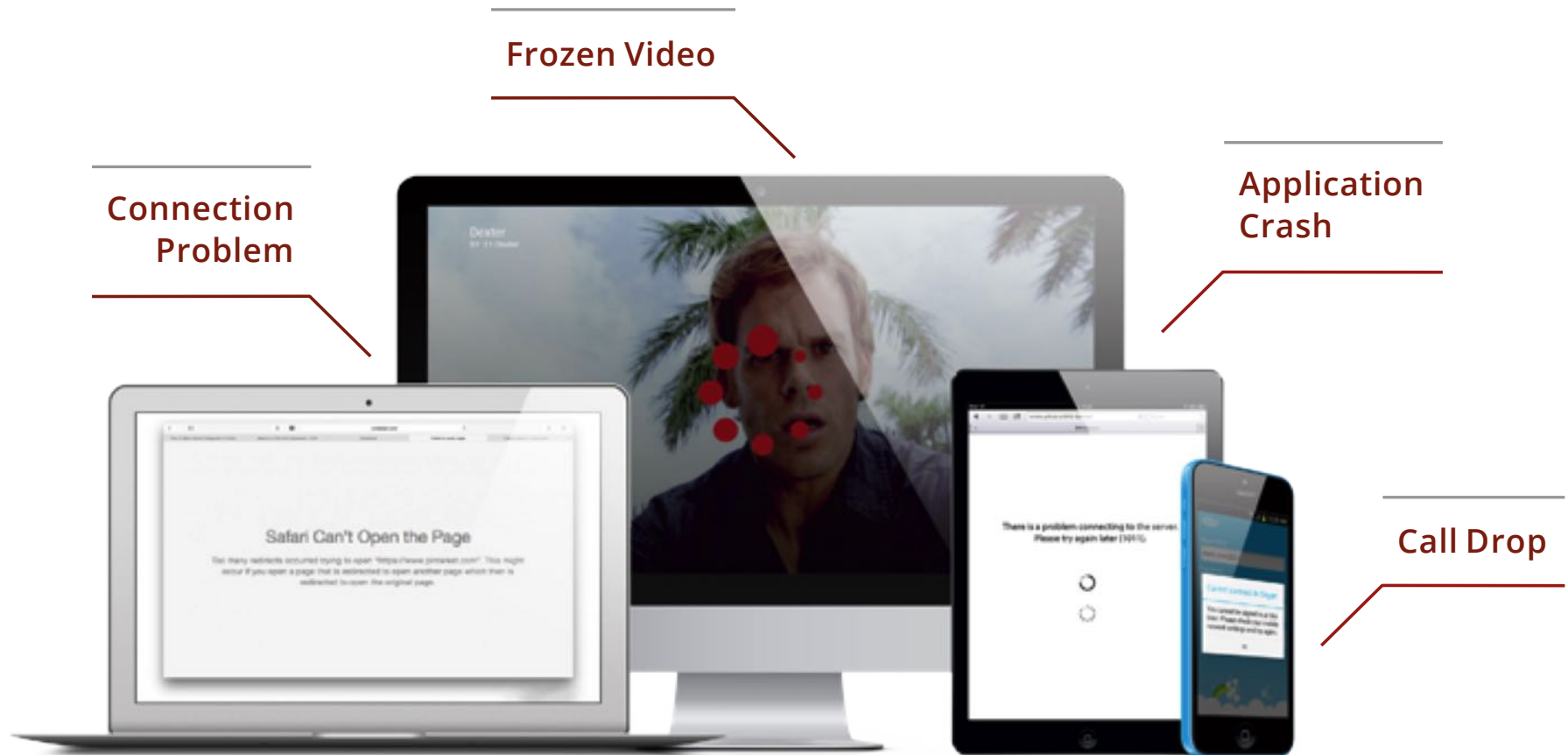|	Value proposition	Witbe Technology	Possible Architectures
	3	9	23

Value Proposition

A
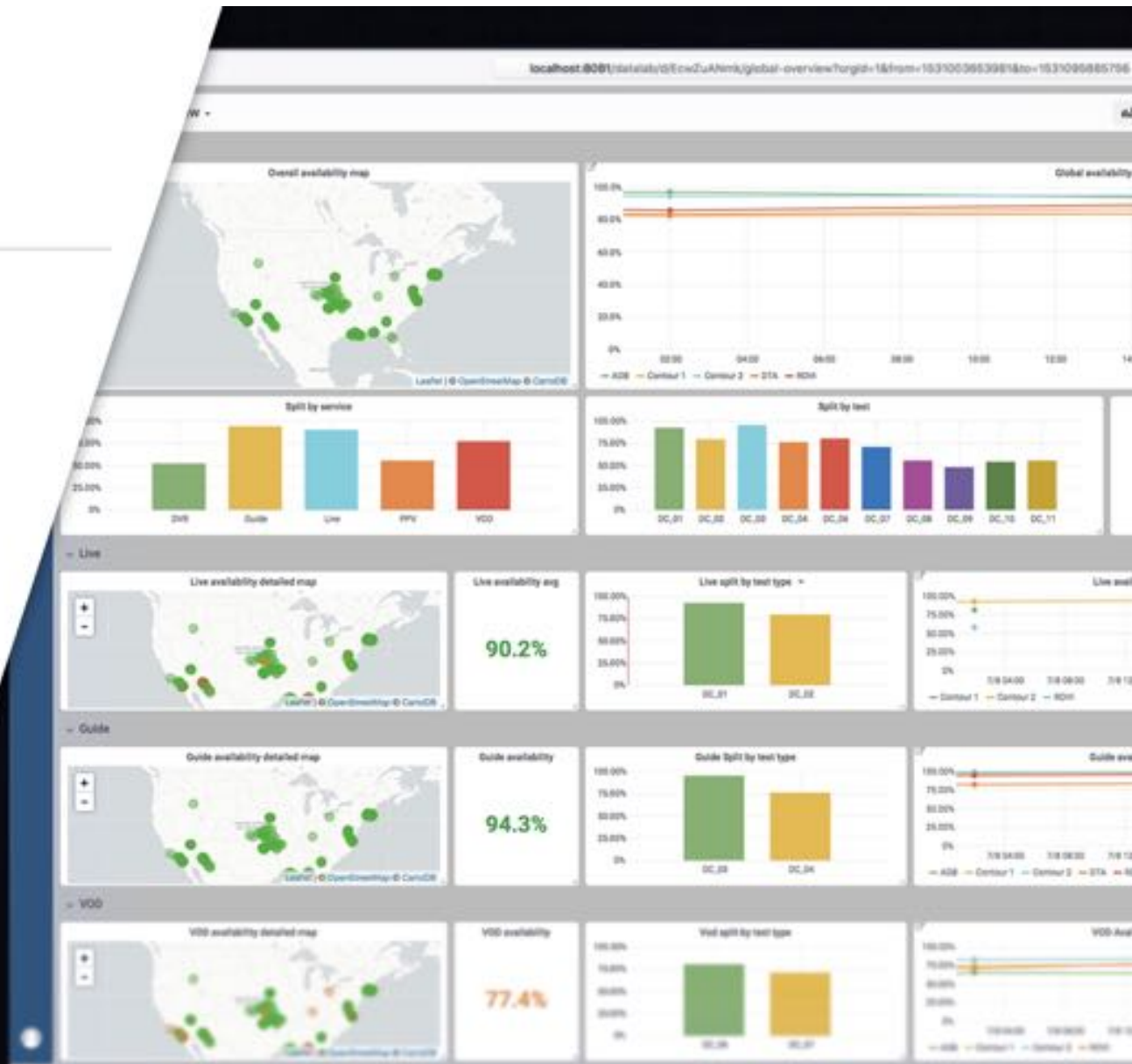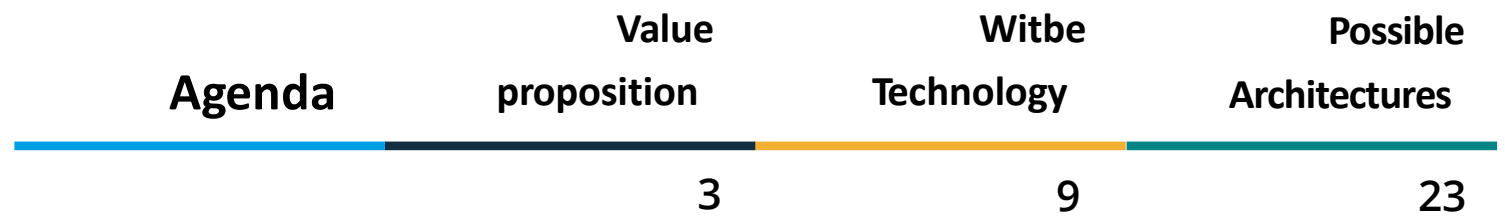
Does this remind you of anything?

Frozen Video

Connection Problem

Application Crash

Call Drop

Safari Can't Open the Page

There is a problem connecting to the server. Please try again later

Our mission:
the best Quality of Experience

Witbe helps companies **make sure the people** who use their digital services **enjoy the best experience possible.**
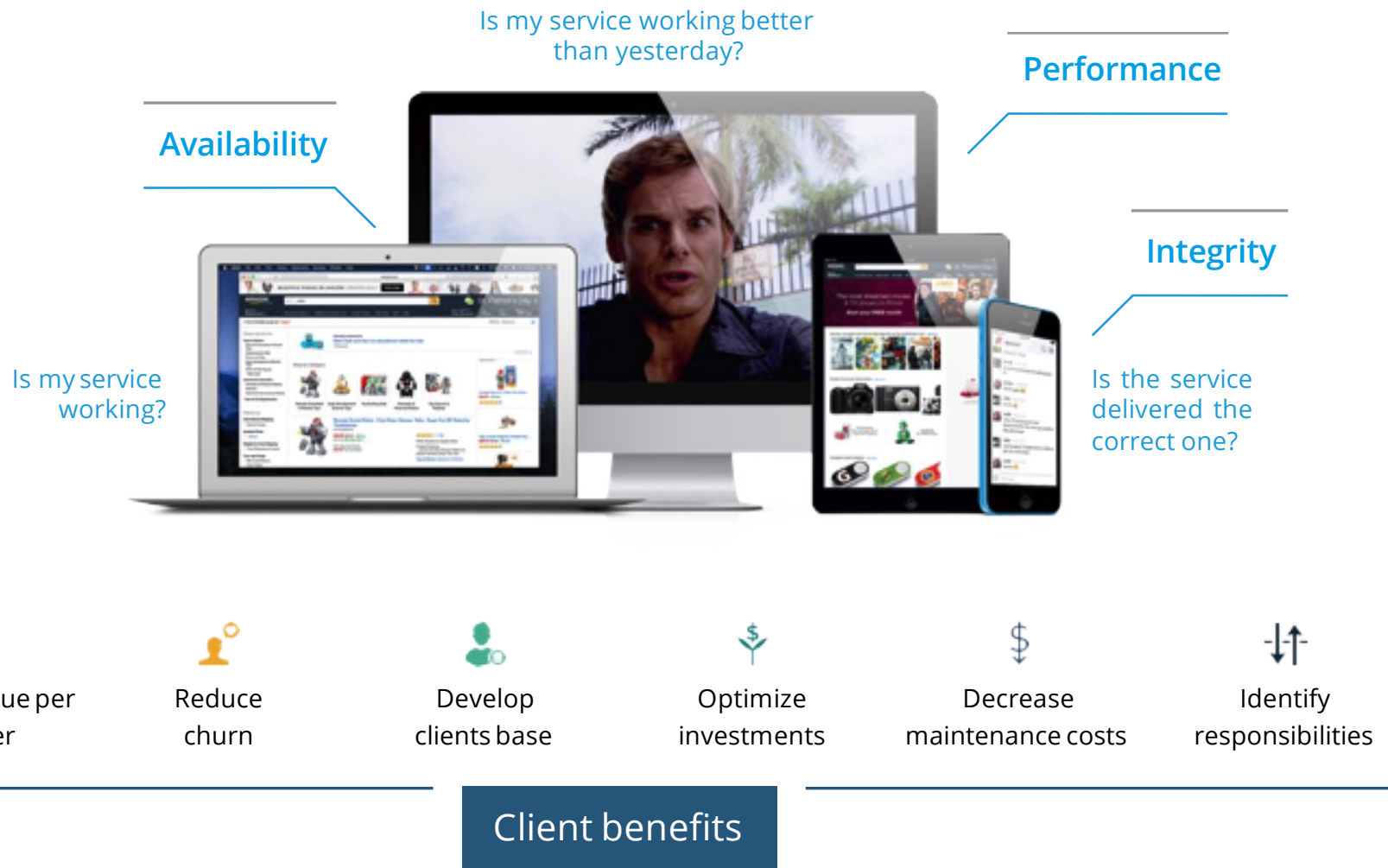
We do so by providing these companies with the technologies and analytics they need to test and proactively monitor the availability, performance and integrity of their digital services offering.

We use a new approach based on **active monitoring**, thanks to intelligent systems called « robots ». **Our robots are able to test any service, on any device, over any network**.

Witbe offers simple answers to complex operational needs

Is my service working better than yesterday?

Performance

Availability

Integrity

Is my service working?

Is the service delivered the correct one?

Increase revenue per subscriber

Reduce churn

Develop clients base

Optimize investments

Decrease maintenance costs

Identify responsibilities

Client benefits

What makes Witbe so unique?

A non-intrusive technology

Multi-service

› Critical business applications
› Unified Communications
› Telephony
› VoD
› Live TV
› Mobile App
› OTT

Multi-network

› Fixed networks
  (High-Speed, Cable, Fiber, Ethernet, etc.)
› Mobile networks
  (Wi-Fi, 3/4G, etc.)

Multi-device

› PC
› Set-Top Box
› Mobile Phones
› Tablets

Unique Algorithms

› Witbe Video MOS
› Smartping
› Remote Eye Controller
› Witbe Earth

Easy to Use

› Easy to setup
› Easy to script
› Easy to run
› Scalable
› User-Centric

Witbe Technology: a single platform covering a wide range of use cases

Witbe Technology

STB testing

Cross-device testing

Triple Play testing

Apps testing

Gateway testing

Video quality management

Witbe Technology
For Test Automation

Witbe Technology
**for Service Assurance &
Proactive QoE Monitoring**

Linear & non-linear TV

VoD Assets checking

Unified Communications

Interactive services

Multi-screen services

CDN – access network & last mile

Services Platform

IT Applications

Competitors benchmarking

Broadband services

Fixed & Mobile Telephony, IVR

Audience measurement

Witbe Technology

B

A complete and holistic QoE monitoring system

Workbench

Robots

Portal

— 1 —

— 2 —

— 3 —

User's behavior can be modelized into typical actions

Users' actions are transcribed in drag-and-drop scenarios

Scenarios are played 24/7 on real devices by Witbe Robots

The robots report on the service quality and alert upon any error

Witbe's Customers can improve User's Quality of Experience

The Witbe Galaxy

The **Customer's Cockpit** gathers three fundamental components. First, the **Workbench**, which offers an easy to use administration platform to create, launch and schedule scenarios and campaigns. Then, **Datalab** transforms the Witbe Robots' data into meaningful and high-level information, and **Witbe Portal** alerts in real- time of any service degradation.

The **Witbe Hub** is the backbone of the Witbe Galaxy. The Maestro handles the dispatch of the different requests and the resources to the different Robots, while the Central System and the Hub Preview store all the data and information produced by the Robots.

The **Witbe Robots** are proprietary appliances able to test any service, from any device, over any network. They interact with services just like real end-users, and measure the quality visually & acoustically… Like your customers do.

Their monitoring capabilities include services like Live TV, Web & Desktop App, VoD, over 3G, 4G, xDSL, OTT…

They also embed proprietary algorithms like the **MOS** and the **Smartping**.

Witbe Robots:
what do they look like?

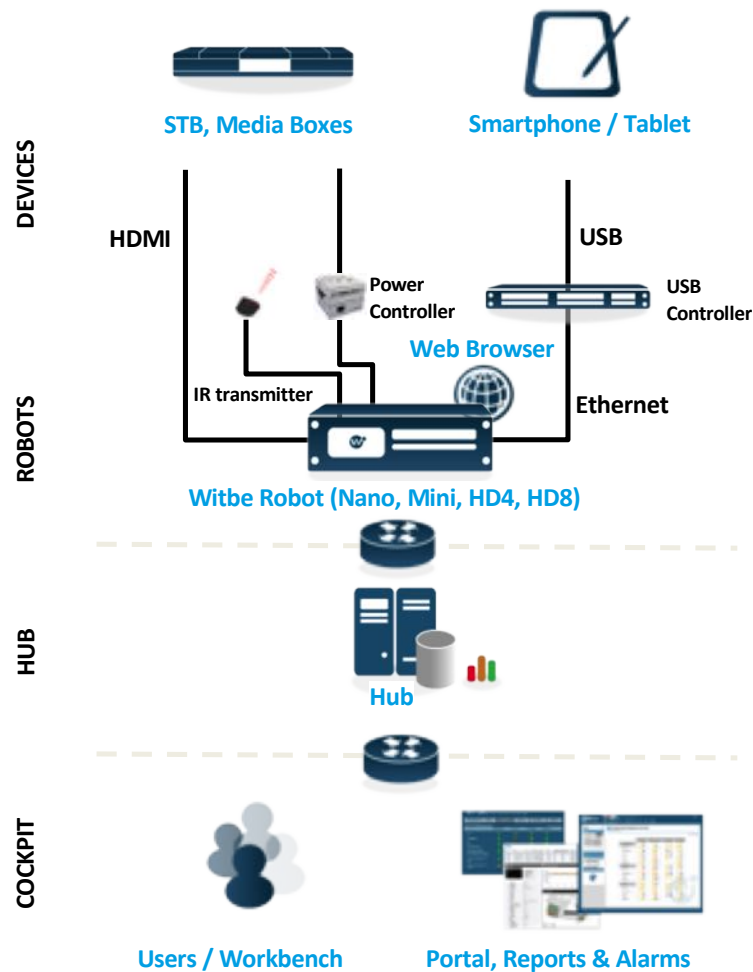**Witbe Robots** on racks

Rack 2U

Mini

Rack 1U

Nano

Virtual Machine

Witbe Robots:
How do they interact with the devices

DEVICES

STB, Media Boxes

Smartphone / Tablet

HDMI

USB

Power
Controller

USB
Controller

Web Browser

IR transmitter

Ethernet

ROBOTS

Witbe Robot (Nano, Mini, HD4, HD8)

HUB

Hub

COCKPIT

Users / Workbench

Portal, Reports & Alarms

✓ **Witbe characteristics**
  - ✓ Active robot, not a passive probe
  - ✓ Non-intrusive, acts like a subscriber
  - ✓ Stable reference
  - ✓ Non-referenced perceptual A/V algorithms
  - ✓ Network - agnostic
  - ✓ Codec - independent
  - ✓ Middleware - independent
  - ✓ Supports encrypted and clear streams
  - ✓ Detects problems caused by any part of the video process: head end, encoding, transport, decoding

Witbe Workbench

Witbe Workbench: the control center of the Witbe Galaxy

Workbench is **the control center of the Witbe Galaxy**, offering a truly simple to use administration platform. It gathers three fundamental components:

› **Device Manager**: configuration made easy and enjoyable, for everyone

› **Script Writer**: develop several dozens of scenarios on several dozens of devices in just one dozen clicks

› **Scheduler**: deploy and manage which scenarios run on what devices, without really having to think about it

Witbe Remote Eye Controller
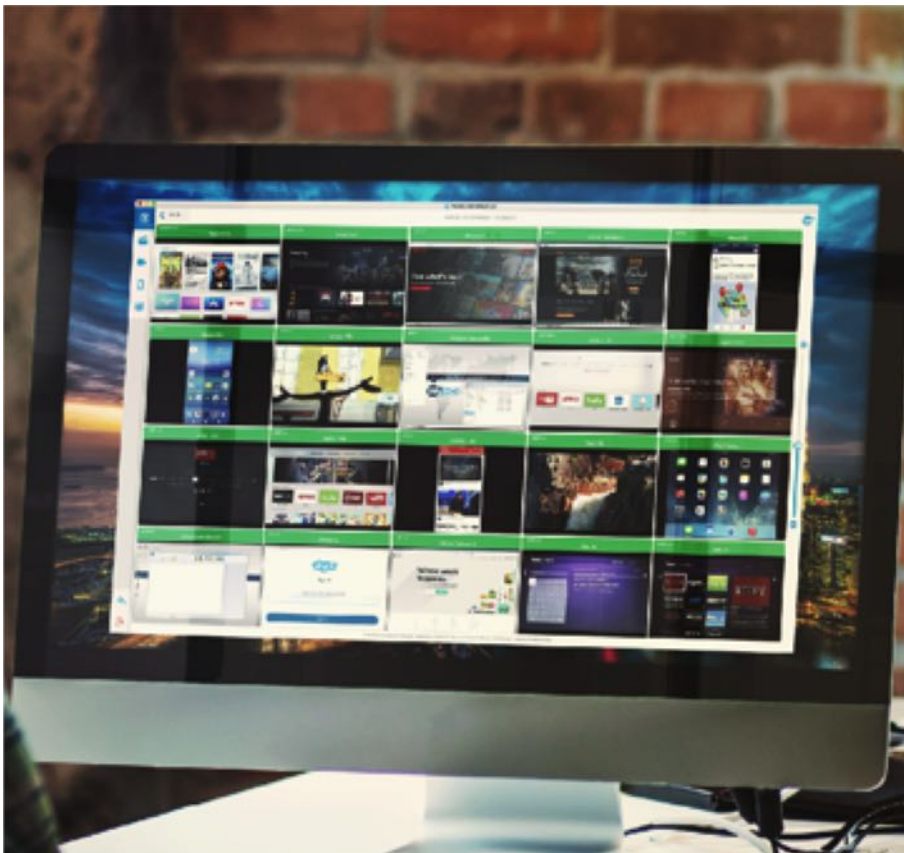
Eyes, ears, and hands: watch and troubleshoot as real end-users

Witbe Remote Eye Controller (REC) gives life to the Witbe Robots in real-time. Using the REC, you can **watch in real-time and remotely take control of your devices in the field, as real customers**. Audio, video, remote control, guide, reboot: troubleshoot any service degradation with hands-on control before your subscribers start complaining.

The only perceptual, non-reference-based video algorithm: Witbe MOS

Measuring in real-time
what it feels like to watch a video

« MOS (Mean Opinion Score) » : Rating, on a scale of 5, **representing precisely how a human perceives the quality of a video stream**.

Witbe Video MOS is a proprietary algorithm. It measures in real-time and **without any reference** stream the audio and video quality truly delivered to the End User.

It provides different KPIs visible by the human eye:

› Jerkiness

› Blockiness

› Blurriness

› Motion analysis

› Spatial complexity analysis

Witbe Smartping

Map your delivery network and locate bottlenecks

The Smartping technology is unique. Whether you own the whole delivery infrastructure or not, **Witbe Smartping maps the critical nodes from end-to-end in real-time, and pinpoints the bottlenecks affecting your streams.** Using this complete view of your networks, you can enforce SLAs with third parties, have a deep understanding of the network routes used by OTT streams, and above all, efficiently improve your OTT delivery.

Witbe Portal

The brain of the Witbe Galaxy

The Witbe Portal **transforms the raw data** produced by the Witbe Robots **into meaningful and exploitable information**. By storing up to 2 years of information collected by the Witbe Robots, the Witbe Portal enables quality assurance teams to understand why the issues detected by Witbe occurred.

Thanks to its multiple analysis components—aggregators, comparators, etc.—, the quality assurance teams **can then significantly improve the services**. And they can even detect the side effects that appear when using all the services simultaneously.
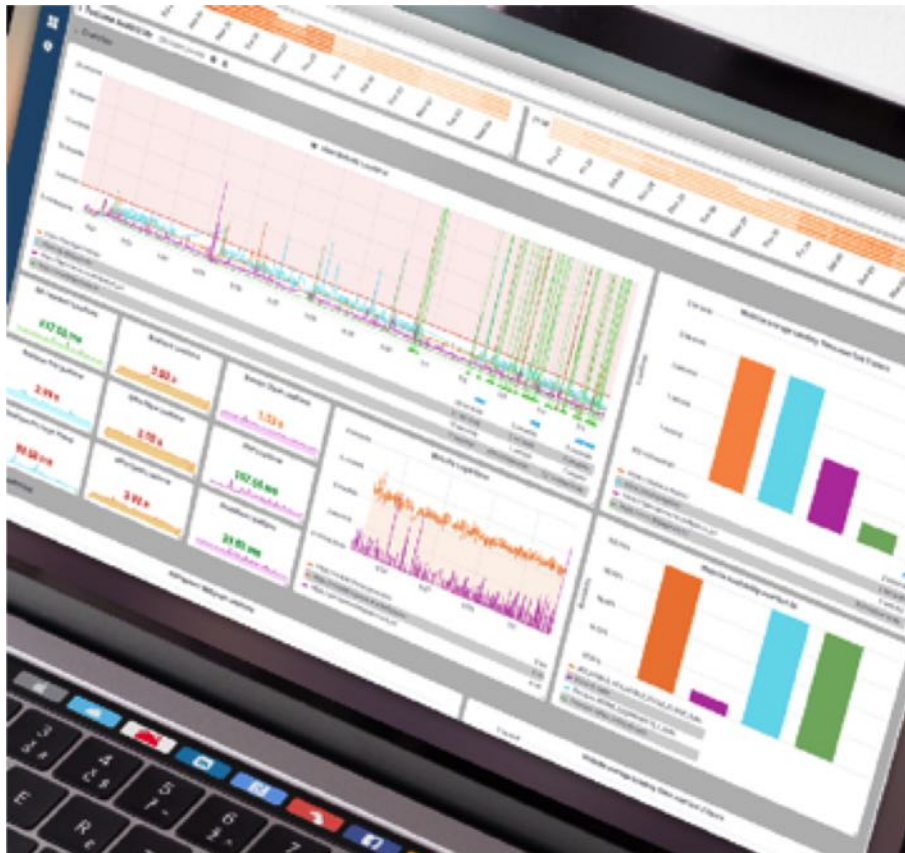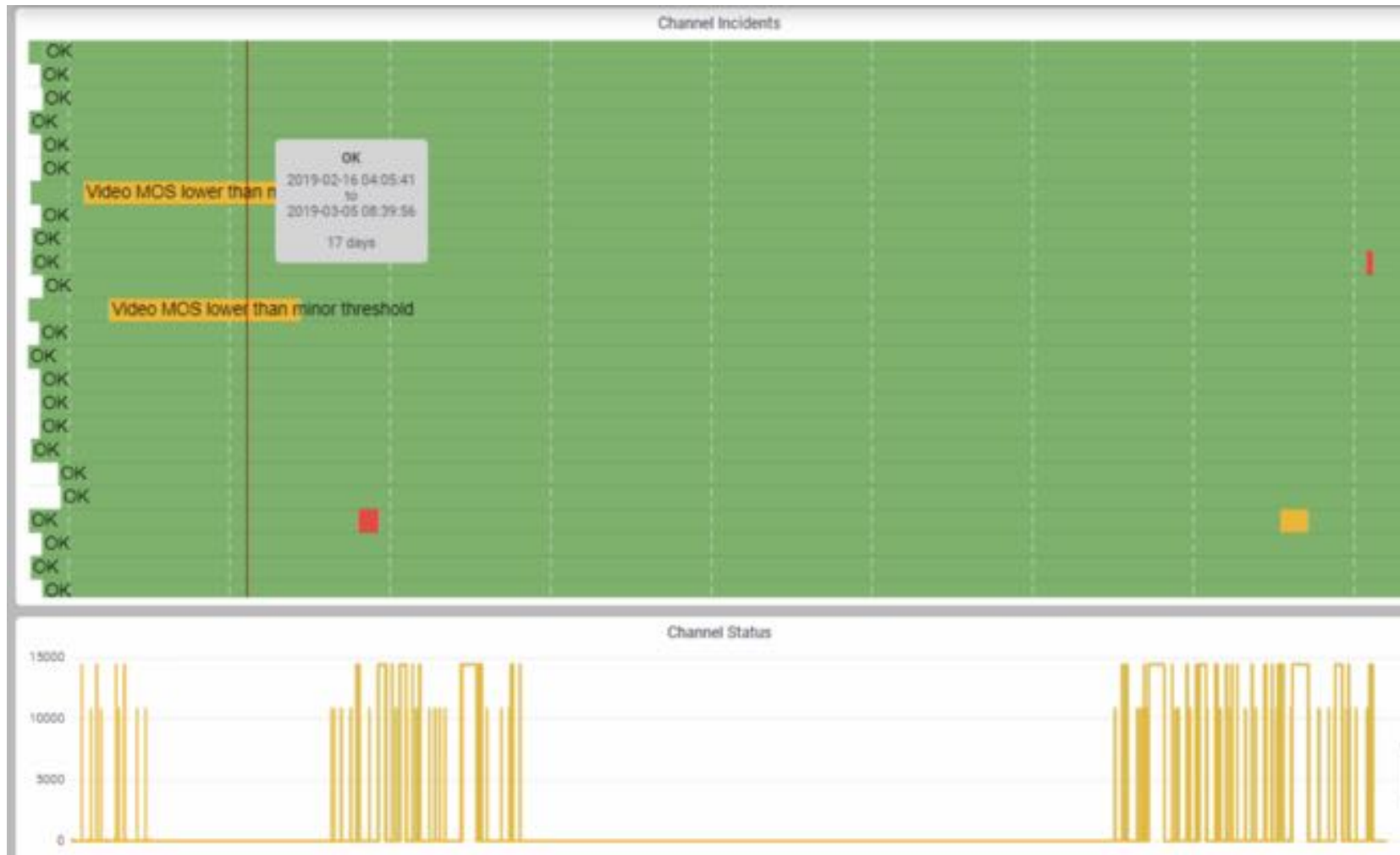
Witbe Datalab

Analyze any service's quality through Witbe's revolutionary reporting interface

Part of the Witbe Suite 6.1, Witbe Datalab has been developed to **greatly improve and refine your Robots' data**, and to enhance the use of your service's KPIs. Accessible from a classic browser, **it provides knowledge on your service's quality with customizable reports**. Executives, decision makers and marketing can see correlation between service and quality. QA & Engineering teams have visibility into performance and infrastructure, and get **another point of entry to drill down**.

1 / Workbench

2 / Robots

3 / Portal

Witbe Datalab for M...

Witbe Datalab for M...

Witbe Datalab for M...

1 / Workbench

2 / Robots

3 / Portal

Witbe at a glance

PUBLIC COMPANY -EURONEXT GROWTH since April 2016

LEADING QoE INNOVATION for 19+ years

+150 COLLABORATORS 32% are R&D engineers

SAN JOSÉ

DENVER

NEW-YORK

MASSAPEQUA, NY FACTORY AMERICA

MONTRÉAL

LONDON

PARIS (HQ)

SINGAPORE

HONG KONG

9 LOCATIONS

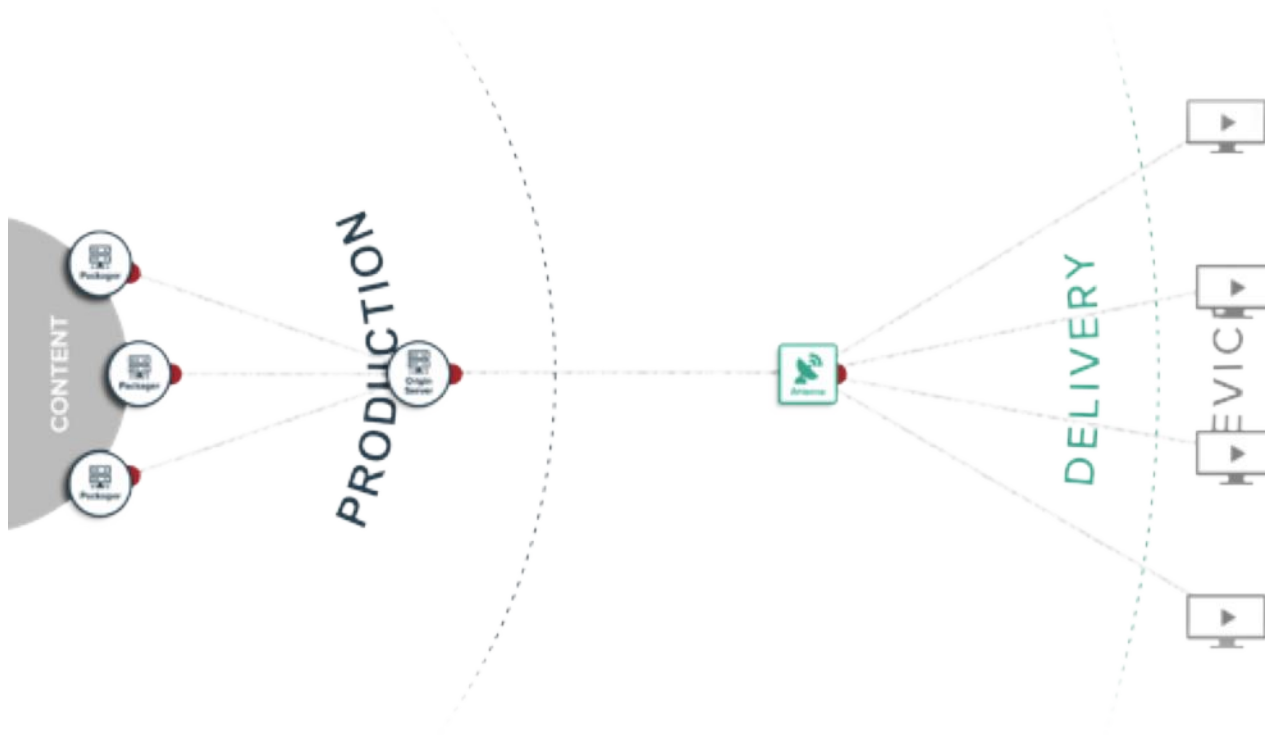# A technology adopted by 300+ customers over 45 countries

C Witbe Story

A long time ago,
in a galaxy not that far away...

A long time ago, networks were very simple. Data was going from point A to point B. A probe reporting a good quality of service meant the end-users were getting a good quality of experience.

Operators and Broadcasters therefore scattered probes (●) over their networks, and directly linked the quality of the network to the Quality of Experience.

The sum of the Quality was equal to the Quality of the sum.
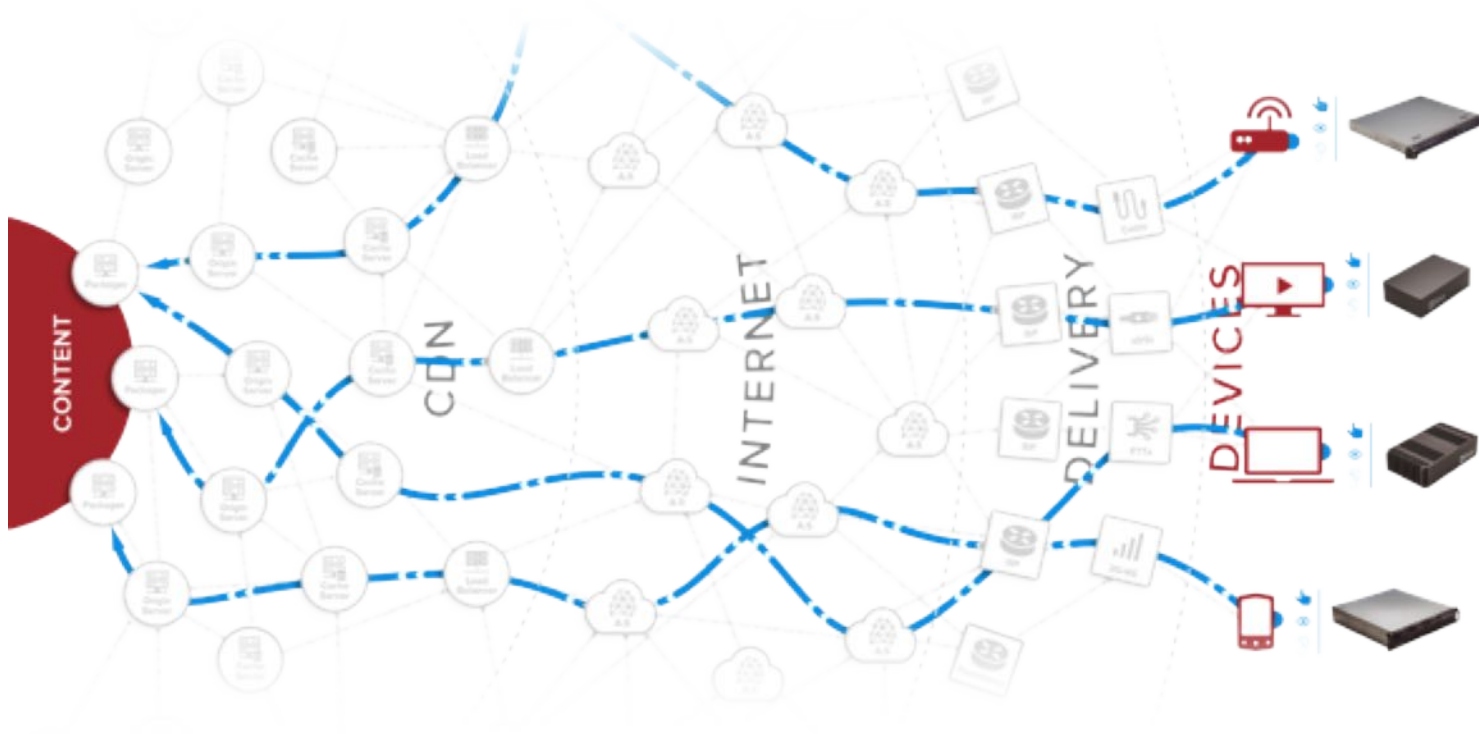
From a passive monitoring through probes
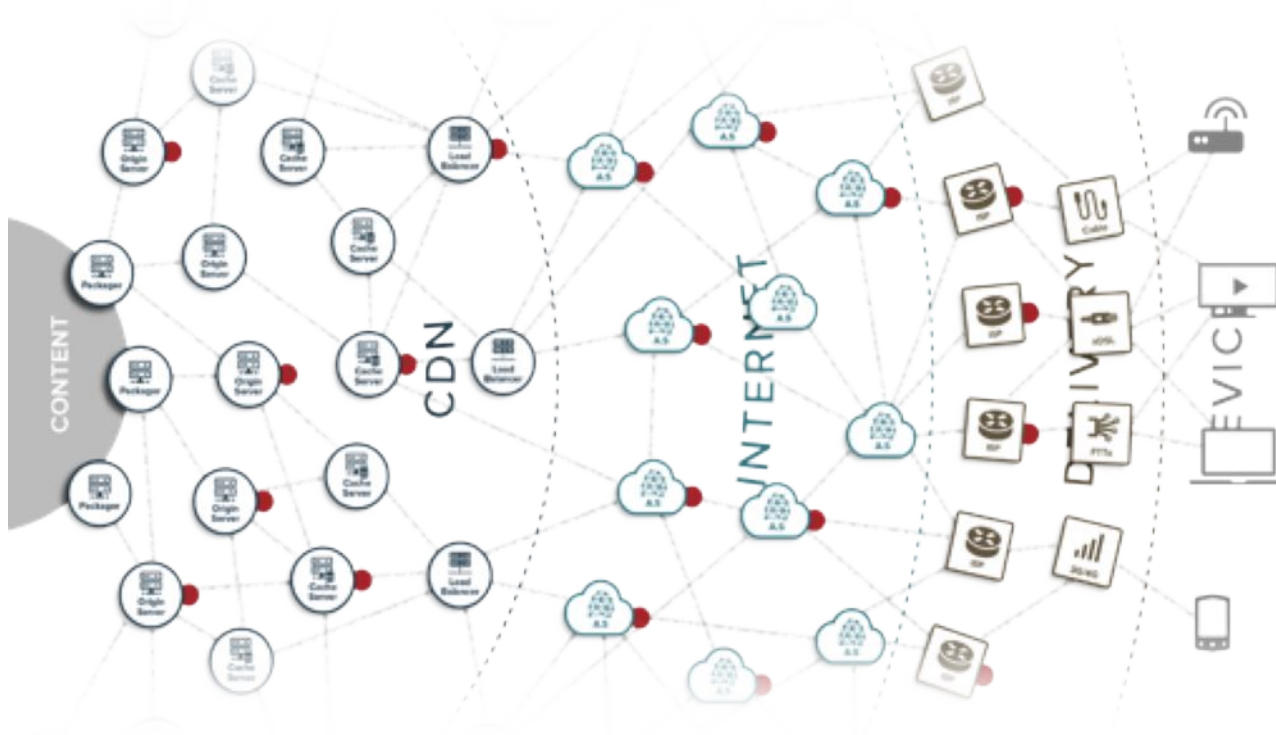
With the Internet, networks have evolved and are now much more complex. Nonetheless, **the way they are monitored has not changed**. Services providers still use probes scattered around the network to check on the quality of service (QoS).

Data today can take many different routes to reach the end-users, and the quality of service can seem good while the quality of experience perceived by the end-users is a disaster.

« The sum of the Quality is no longer equal to the Quality of the sum. »
— Jean-Michel Planche

...to an active monitoring with Witbe Robots

The Witbe robots perform active requests, ensuring **a monitoring from edge to core.**

And that's where Witbe robots can help.

By using digital services and devices just like normal end users, they can assess whether the service is delivered, whether it is the correct one, and whether it works as well as it should. Thanks to powerful algorithms, they can evaluate the quality of experience of a service visually.

Strategically placed over a network and testing a service 24/7, Witbe robots are able to proactively detect any service deterioration and can locate where the issues are coming from.

Pioneering QoE Monitoring

INNOVATIONS

INTERNET SERVICES

VoIP SERVICES

IPTV IN EUROPE

LAUNCH OF YOUTUBE

HD VIDEO SERVICES

APPLE: FIRST IPHONE PRESENTATION

FIRST 4G NETWORKS

3D VIDEO

OTT VIDEO SERVICES

FIFA WORLD CUP STREAMED IN 4K

WITBE MONITORING CAPABILITIES

2000 2003 2004 2006 2008 2011 2012 2013 2014 2015

INTERNET

VoIP

IPTV

VIDEO STREAMING

HD VIDEO

iOS / ANDROID

4G MOBILE

3D VIDEO

OTT

4K STANDARD

Witbe is **precursing QoE Monitoring** and **anticipating major technological innovations** since 2000.