

Empirix PACE

An on-premises active monitoring solution to ensure a continuously high quality customer experience

QUALITY OF EXPERIENCE CHALLENGES

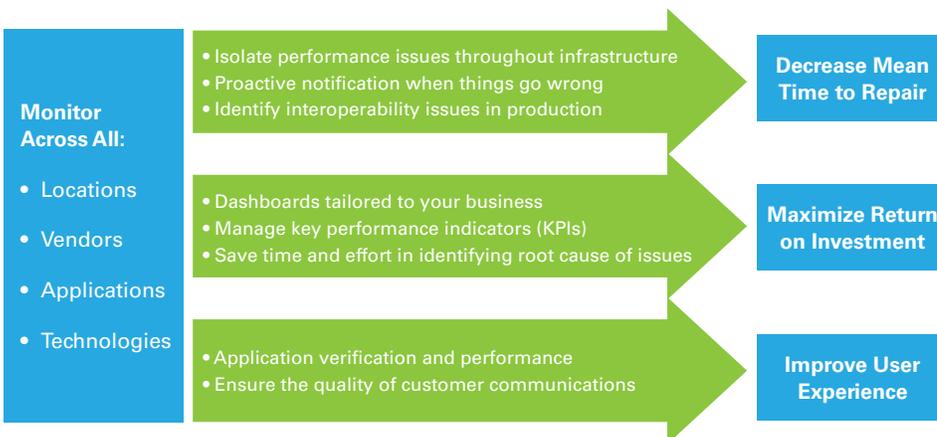
Quality of experience (QoE) depends on the technology infrastructure involved in an end-to-end transaction. Today's technology infrastructures are complex implementations of devices and applications from multiple vendors.

While technology infrastructure components can be tested independently, what matters most is how they operate end-to-end in a production environment (where a failure frequently results in multi-directional finger pointing). Finding a problem's root cause in a production environment is often extremely challenging and time consuming: Diagnosing current and potential problems in an end-to-end environment requires much more than independent component testing.

It is estimated that up to 84% of organizations lack adequate tools to sufficiently monitor and manage QoE, and identify the issues that cause problems¹. As a result, they face key challenges, including:

- ▶ Customer impacts before experience issues are known
- ▶ Lack of visibility into locations across a wide area network
- ▶ Difficulty meeting minimal service level commitments
- ▶ Inability to verify application performance and uptime
- ▶ Inability to verify data reliability
- ▶ Failure of traditional key performance indicators (KPIs) to adequately signal issues

These challenges can arise whenever applications or equipment in the communications infrastructure are modified. Application and equipment changes frequently disrupt existing call paths.



Financial Benefits

- ▶ Reduces financial risk, including:
 - Penalties
 - Regulatory
 - SLA
 - Transaction disputes (call recording)
- ▶ Reduces cost of issues and problems
 - Voice quality issues raise the costs of service by 34% or more
 - Reduces mean time to recognize
 - Mitigate sooner (fewer customers impacted)
- ▶ Reduces mean time to repair and the expenses related to identifying problems and downtime
 - Identify where the impact needs to be addressed
 - Require less support to identify which skills required based on where failure occurs
- ▶ Increases return on investment (ROI) of telephony infrastructure
 - Optimizes performance
 - Reduces the cost of technology failures
 - Reduces customer impacts
 - Increases IVR/voice portal containment rates
 - Reduces default routing
 - Reduces non-working toll free network costs

FIGURE 1. IMPROVE USER EXPERIENCE AND MANAGE OPERATIONAL COSTS

1. "The Machine Doesn't Understand Me: The Costs and Impact on the Customer Experience of Poor Voice Quality", Professor Morris Pentel, Chairman, Customer Experience Foundation, November 2010

EMPIRIX PACE FOR ADVANCED PROACTIVE MONITORING OF QUALITY OF EXPERIENCE

Empirix Proactive Automated Customer Experience (PACE) uniquely provides assurance of the real customer experience and an understanding of total performance. The PACE active monitoring solution serves as a foundation for tracking and recognizing trends in individual applications and customer paths to enable organizations to more quickly address—and even prevent—service-impacting problems.

PACE can both materially improve QoE and manage operational costs by verifying actual performance to help organizations ensure the quality of their voice and video communications.

PACE reduces mean time to repair by isolating performance and quality issues—including multi-vendor interoperability problems—throughout the infrastructure and proactively sends notifications when issues are identified. This capability greatly enhances the ability to address problems with minimal impact to QoE. Dashboards with KPIs save time and effort in identifying root causes of issues.

Empirix PACE ensures a great customer experience by using actual automated calls to traverse applications and possible call paths in order to best understand customers' and users' quality of experience when impacted by real-time performance and quality issues. Resources that are shared between applications and call paths are monitored to ensure that they are being leveraged effectively.

With PACE, teams responsible for operations support, deployment, and development can gauge infrastructure readiness and project success, answering questions including:

- ▶ How efficiently are we doing our job?
- ▶ How effective are we at satisfying our customer's needs?
- ▶ Are we complying with industry requirements?
- ▶ How well we are performing against/compared to our business objectives?

PACE provides measurable results and status.

EMPIRIX PACE DELIVERS END-TO-END VOICE COMMUNICATIONS

Monitoring Empirix PACE is an on-premises active monitoring solution measuring bi-directional voice quality actually experienced by users from start to finish.

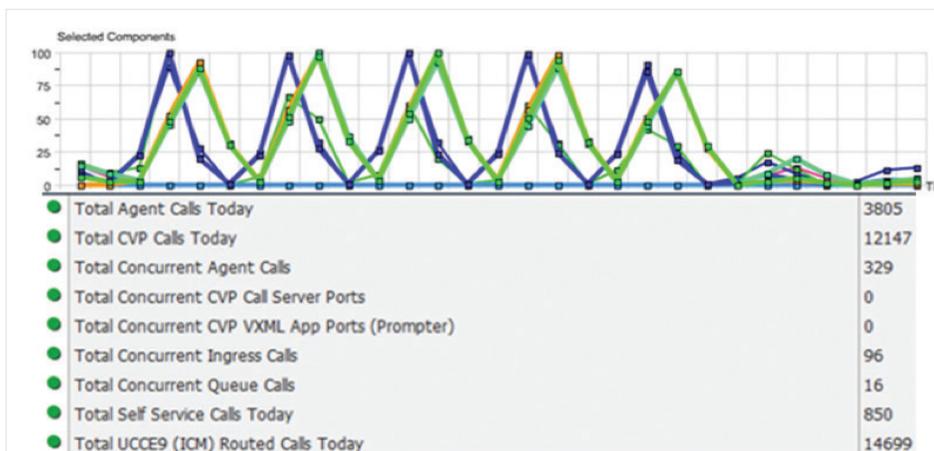


FIGURE 2. IMPROVE USER EXPERIENCE AND MANAGE OPERATIONAL COSTS

Key PACE Monitoring Capabilities

- ▶ Voice quality
 - ▶ Bi-directional
 - One-way voice quality (contact center or branch)
 - Hairpin voice quality (contact center or branch)
- ▶ IVR/voice portal
- ▶ CTI data delivery and routing engine availability
- ▶ Outbound dialing: VQ, ANI and caller ID validation
- ▶ Conference bridge monitoring: owned and service
- ▶ Outbound dialer monitoring
- ▶ Desktop: screen pop response time
- ▶ Call recording: Verint, NICE, I3
- ▶ Dashboards
- ▶ Alarms
- ▶ Reports

PACE leverages Empirix’s industry leading, patented Hammer test generation technology to provide valuable insights regarding key performance and troubleshooting questions:

- ▶ Does a call path exist between two locations—can they connect?
- ▶ What is the voice quality of each connection?

Real calls are placed into the voice infrastructure and applications, emulating both the caller and the person answering the call. Calls are recorded from the time that the caller dials. Troubleshooting teams can actually hear the caller’s experience.

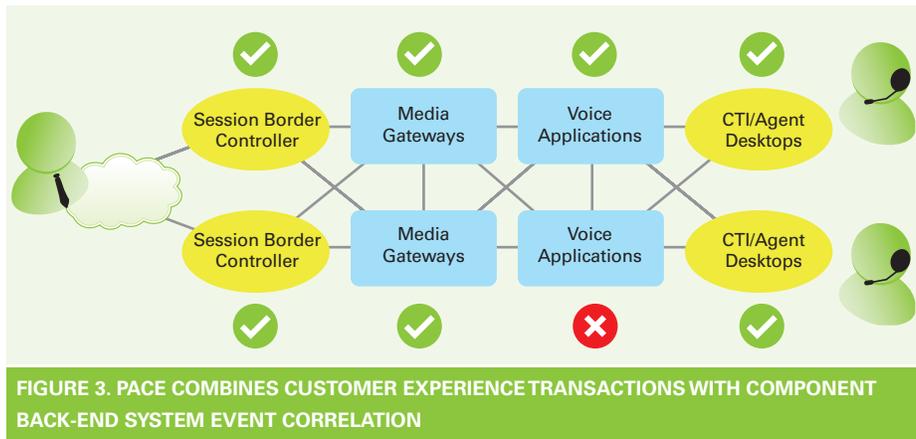
The on-premises console enables deeper collection of data to provide root-cause correlation using log files, SNMP, WMI, Windows Perfmon, URL, DNS, Database and SSH Virtual Agent.

Empirix PACE verifies and measures voice quality using test scenarios through the infrastructure:

- ▶ Latency of call connectivity and voice quality
- ▶ For voice self-service and dialer capabilities:
 - Latency of connectivity, application servers, and backend hosts
 - Any expected prompting
 - Call classification and compliance
 - Call routing and CTI data delivery with CTI VAS for CTI routing
- ▶ For agent desktop:
 - Screen pop latency of agent desktop application
 - Recording validation

Call routing and data delivery are validated. PACE emulates agents logged into CTI Interfaces such as Avaya IC, Genesys or Cisco. Numerous performance metrics are provided covering phone calls, including time to connect and greet, plus application response times.

Early notification of current and potential problems enables risk mitigation changes to be enacted. Dashboards and analytics offer valuable insights that help to expedite mean time to repair. (Figure 3).



PACE PESQ METRIC PROVIDES DEEPER QoE UNDERSTANDING

Operations teams often perceive the mean opinion score (MOS) as an assessment of voice quality and performance. But MOS is only a subjective network performance indicator, not the quality of voice. In today’s tools, MOS is an estimate based on network conditions and provides no insight into the actual voice stream or how individual pieces of equipment have impaired it throughout its journey.

In order to overcome the limitations of MOS, Empirix leverages the worldwide industry standard for objective voice quality testing, perceptual evaluation of speech quality (PESQ). PESQ accurately measures active voice quality by modeling human perceptions of speech and is calculated by transmitting a known voice sample through a network, recording the voice on the “other side,” and then comparing the original sample with the received sample.