## End-to-End Voice Assurance

# Advancing beyond

#### Executive Summary

### Visibility is the key to network automation.

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Ensuring high-quality voice services is critical for operators aiming to provide superior customer experiences and maintain a competitive edge. According to the Ericsson Mobility Report, VoLTE subscriptions will reach 7.6 billion by 2028, emphasising the necessity for robust and reliable VoLTE performance monitoring solutions.

#### Challenges

Mobile Network Operators (MNOs) face several critical challenges, particularly with VoLTE (Voice over LTE) and VoNR (Voice over New Radio), including call disruptions, interoperability issues, and ensuring high-quality voice and video calls. Traditional performance monitoring systems often fall short due to fragmented data records and limited end-to-end visibility, resulting in inefficiencies and, ultimately, customer dissatisfaction.

#### **Our Solution**

Anritsu's End-to-End Voice Assurance solution offers comprehensive endto-end VoLTE and VoNR performance monitoring, seamlessly integrating data from 4G and 5G Access and Core IMS networks. This innovative solution consolidates all protocols into a unified view, providing operators complete visibility and control over their packet-switched voice services.

#### Value Delivered

**Enhanced Customer Experience:** Reduces call drops, improves voice quality, and ensures seamless handovers, leading to higher customer satisfaction.

#### **Operational Efficiency:**

Automates troubleshooting processes and provides detailed insights, reducing the time and resources required for issue resolution.

#### **Competitive Advantage:**

Empowers operators to compete effectively with OTT services by delivering superior VoLTE & VoNR quality and reliability.

#### Long-term Investment:

Optimises spectrum utilisation and network robustness, making it a strategic investment for future network evolution.

#### **Key Features**

#### Unified View:

Combines meaningful information from access and core networks into a single, multidimensional data record, ensuring no gaps in monitoring.

#### End-to-End Visibility:

Tracks every element from eNodeB/gNodeB to IMS nodes, enabling precise identification and troubleshooting of issues. This visibility is the key to network automation.

#### Performance Monitoring:

Monitors call setup and drop performance, voice quality, and other critical KPIs across the entire VoLTE and VoNR ecosystems.

#### **Roaming Support:**

Identifies and optimises VoLTE and VoNR performance for roaming scenarios, enhancing service quality for both local and international users.

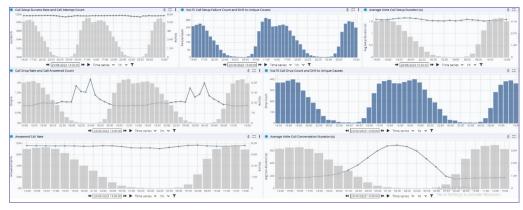
#### Real-Time Analysis:

Provides real-time detection and diagnosis of issues, ensuring immediate action to maintain service quality.

Anritsu's End-to-End Voice Assurance solution is designed to meet the strinaent demands of modern networks. telecommunication It. provides unparalleled end-to-end visibility and performance monitoring for VoLTE and VoNR services. By leveraging this solution, operators can ensure high-quality voice services, optimise their network performance, and enhance customer satisfaction, all while preparing for future advancements in network technoloav.

#### Solution Overview

### ...a single, cohesive data record for each call...



As the telecommunications industry continues to evolve, providing high-quality VoLTE and VoNR services remains a top priority for service providers. The transition to 4G and beyond, including the emergence of 5G, has brought significant improvements in speed and connectivity but also poses challenges in maintaining seamless voice communication. Anritsu's Endto-End Voice Assurance addresses these challenges head-on, offering advanced, comprehensive an approach to VoLTE and VoNR performance monitoring.

#### Key Challenges Addressed

#### Fragmented Monitoring Systems:

Traditional performance monitoring systems often involve separate data records for different network parts, such as LTE access, 5G access and Core IMS. This fragmentation results in divided insights and hinders effective troubleshooting. Operators struggle to correlate data from multiple sources, leading to longer resolution times and higher operational costs. By unifying these disparate data records, Anritsu's End-to-End Voice Assurance brings comprehensive visibility, for quicker identification and resolution of network issues.

#### **Quality Assurance:**

Ensuring high-quality VoLTE and VoNR calls is paramount for customer satisfaction. Operators face challenges such as call drops, poor voice quality, and inefficient handovers, which directly impact user experience. End-to-End Voice Assurance continuously monitors key performance indicators (KPIs) like call setup time, call drop rate, and voice quality metrics (e.g., MOS, packet loss). This real-time monitoring helps operators maintain high service quality, detect potential issues early, and implement corrective measures promptly.

#### Interoperability Issues:

Integrating multiple technologies, including legacy networks (2G/3G), services, and newer 5G VoIP networks, adds complexity to network Different management. teams often manage these technologies, complicating the troubleshooting process and increasing the risk of miscommunication. Anritsu's Endto-End Voice Assurance bridges this gap by providing end-to-end visibility across the entire voice ecosystem. This unified approach simplifies the management of multitechnology environments, ensuring seamless interoperability and efficient operations.



#### Benefits

#### Solution Overview

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...maintain high customer satisfaction and loyalty levels.

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#### **Enhanced Customer Experience**

Anritsu's End-to-End Voice Assurance significantly improves the quality of VoLTE and VoNR services, reducing call drops and improving voice quality. The solution ensures seamless handovers between network elements, providing a more reliable and enjoyable user experience. By proactively monitoring and addressing performance issues, operators can maintain high customer satisfaction and loyalty levels. This enhanced customer experience is critical for reducing churn rates and fostering long-term customer relationships.

#### **Operational Efficiency**

End-to-End Voice Assurance automates many troubleshooting processes, reducing the time and resources required for issue resolution. Detailed insights into network performance help operators identify inefficiencies and optimise their operations. This automation saves time and reduces the likelihood of human error, leading to more accurate and effective troubleshooting. The solution's comprehensive data allows for informed decision-making, enhancing overall operational efficiency.

#### Competitive Advantage

By delivering superior VoLTE and VoNR quality and reliability, Anritsu's Endto-End Voice Assurance empowers operators to compete effectively with Over-the-Top (OTT) services. High-quality voice services are a crucial differentiator in a crowded market, helping operators attract and retain customers. The solution's ability to provide real-time insights and proactive management ensures operators can maintain optimal performance levels, giving them a competitive edge. Additionally, the strategic investment in the solution prepares operators for future advancements in network technology, including the transition to 5G.

#### Long-term Investment

Anritsu's End-to-End Voice Assurance optimises spectrum utilisation and enhances network robustness, making it a valuable long-term investment for operators. The solution supports sustainable growth and scalability by ensuring efficient use of network resources. The comprehensive monitoring troubleshooting and capabilities prepare operators for future network evolutions, including adopting new technologies and standards. Investing in the solution addresses current challenges and positions operators for success in an increasingly complex and competitive telecommunications landscape.

The solution also:

- Provides unique root causes for Core and Access
- Provides monitoring per Core IMS
  Network Element
- Provides accurate Cell Location for SIP calls

#### **Technical Highlights**

#### **Unified Data Records**

Anritsu's End-to-End Voice Assurance solution integrates SIP/RTP and S1-MME protocols into a single, cohesive data record for each call. This unification captures all relevant information from both the originating and terminating sides, providing a

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#### Solution Overview

### The solution automates many troubleshooting processes...

holistic view of the call. The detailed tracking includes call setup, quality, and release causes for VoLTE and VoNR, enabling operators to identify and address issues precisely. This comprehensive data collection reduces the complexity of monitoring and troubleshooting, enhancing operational efficiency.

#### End-to-End Visibility

End-to-End Voice Assurance offers complete visibility across the entire VoLTE and VoNR ecosystem, from the eNodeB and gNodeB in LTE and 5G access networks to the Core IMS nodes. This extensive coverage allows for precisely identifying performance bottlenecks and root causes of issues. Operators can monitor the performance of each network element, ensuring optimal functioning and quick resolution of problems. The solution's ability to provide accurate call location data further enhances troubleshooting capabilities, making pinpointing and addressing issues easier.

#### **Performance Monitoring**

End-to-End Voice Assurance continuously monitors critical KPIs such as call setup time, call drop rate, and voice quality metrics. It provides detailed insights into VoLTE and VoNR performance, ensuring operators can maintain high-quality voice services. Real-time analysis and alerts enable proactive network performance management, allowing operators to detect and resolve issues before they impact users. This capability is crucial for maintaining customer satisfaction and minimising service disruptions.

#### **Real-Time Analysis and Alerts**

With End-to-End Voice Assurance, operators receive real-time detection and diagnosis of issues and automated alerts for any deviations from expected performance. This functionality allows for immediate action to maintain service quality. The system's proactive approach ensures that potential problems are addressed swiftly, reducing downtime and enhancing the overall user experience. Integrating real-time analytics empowers operators to stay ahead of network issues and maintain optimal performance.

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#### **Roaming Support**

The End-to-End Voice Assurance solution identifies and optimises VoLTE and VoNR performance for roaming scenarios, ensuring consistent service quality for both local and international users. It provides detailed data on roaming partners, helping operators manage and enhance their roaming agreements. By monitoring **KPIs** specific to roaming, such as call success rates and quality metrics, it enables operators to deliver customers a seamless experience, regardless of location. This capability is essential for maintaining competitive advantage in a global market.

"Reduced investigation time from 60 minutes to 60 seconds"



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