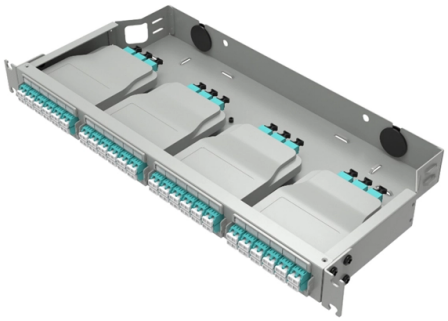
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ASEAN Ten Countries Bit Error Rate Remote Monitoring Type



Overview

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Key Takeaways

Bit Error Rate (BER) in ASEAN networks is monitored remotely using standardized digital performance metrics such as BBE, ES, SES, and UAS, following ITU-T recommendations and Optical Transport Network (OTN) practices.Overview of BER and Remote Monitoring

Bit Error Rate (BER) measures the number of bit errors in a digital transmission relative to the total transmitted bits, providing a fundamental indicator of signal quality in communication networks . Remote monitoring of BER is essential for network operators to ensure service reliability, detect degradation, and maintain compliance with service-level agreements (SLAs). In ASEAN, digital networks are increasingly aligned with ITU-T standards and the ASEAN Digital Masterplan 2025, which promotes harmonized regulatory frameworks and network performance monitoring across member states .

Remote Monitoring Types
• End-to-End BER Monitoring
• Uses Bit Error Rate Testers (BERTs) to generate test patterns and measure errors across the entire transmission path .

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• Can be implemented in loopback mode at remote nodes, allowing operators to verify link quality without physical presence.

• OTN Path Monitoring
• Optical Transport Networks (OTN) employ Path Monitoring (PM) at the ODU layer to collect BER-related counters remotely .

• Key performance parameters include:
• Background Block Error (BBE): Counts block errors in normal operation.

• Errored Seconds (ES): Seconds with at least one error.

• Severely Errored Seconds (SES): Seconds exceeding a threshold of errors.

• Unavailable Seconds (UAS): Periods when the path is considered unavailable.

• These metrics are collected in 15-minute or 24-hour intervals and reported to Network Management Systems (NMS) for remote supervision.

• Digital-IF/RF-Digital BER Verification
• For RF and wireless systems, BER can be monitored remotely by generating a digital stimulus at the transmitter and capturing the digital output at the receiver .

• This method allows end-to-end verification of the transmit-receive chain, including analog-to-digital and digital-to-analog conversions.

Implementation in ASEAN Networks
• ASEAN countries are adopting ITU-T G.826, G.8201, and G.828 standards for error performance monitoring .

• Remote BER monitoring is integrated into network management systems to support:
• SLA compliance

• Fault detection and localization

• Performance benchmarking across international and domestic links

• The approach is consistent across terrestrial, submarine, and metro DWDM networks, ensuring interoperability and harmonized quality assessment.
Summary

In the ten ASEAN countries, remote BER monitoring relies on a combination of standardized ITU-T metrics, OTN path monitoring, and BERT-based testing. These methods provide operators with actionable insights into network quality, enabling proactive maintenance and alignment with regional digital transformation goals .

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The FPGA counts the number of errors and calculates the BER internally. Conclusion Overall, BER testing using a BER meter in a

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As an example, if our specified BER is 10-12, and we require a typical confidence level of .95 (95%), the required

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Pattern detector Errors are identified using bit-by-bit comparison of the incoming data stream with the expected sequence. Errors

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Error-count & total bits → BER: BER = errors / total bits. The longer you test and the higher the data rate, the more

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