ACCEDIAN

Solution Brief

Improve 5G access performance and differentiate end-to-end SLAs

Skylight's granular monitoring and analytics enables access providers (AAVs) to step up 5G xhaul performance

Mobile operators are currently upgrading mobile backhaul to support 5G speeds and new low-latency services, as well as increasing cell site capacity to at least 10Gbps. The access network is at the front-end of customer experience and one of the most important parts of the mobile network in terms of impact on service quality.

With 5G standalone networks, the RAN will be more distributed together with small cell densification, and access split into fronthaul, midhaul, and backhaul. Multi-access edge computing (MEC), that enables high bandwidth and ultra-low latency access to the edge cloud for application developers and content providers, will require changes in caching and/or local breakout capability.

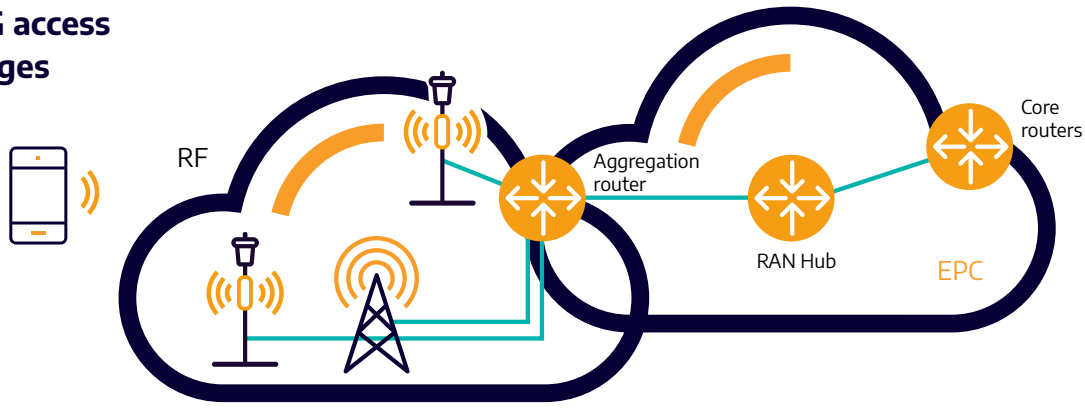
These new 5G requirements and stricter end-to-end SLAs make it critical for Alternative Access Vendors (AAVs) to optimize 5G access performance.

Challenges

- New low-latency 5G service requirements will require AAVs to monitor and deliver more stringent and granular end-to-end SLAs
- The 5G standalone split access architecture of fronthaul, midhaul and backhaul will need to be supported and managed
- There will be new requirements for AAVs and wireline providers to support MEC edge interconnects, secure cloud gateways, and Internet break-outs

Fiber backhaul usage is expected to grow to just under 40% of global macrocell backhaul links by 2025, according to the GSMA. AAVs that provide Ethernet backhaul access for 5G will need to support new 5G services at exceptional scale, data rates, and low latencies. Performance monitoring tools have to be more precise and accurate to ensure services are delivered successfully to end customers and can be continually assessed and optimized.

AAV 5G access challenges



Radio interface + AAV/access KPI impact + Core transport

Addition of KPI requirements across the network segments equals the total SLA budget that must be met.

KPI	LTE-Rel-8*	5G (2020)	Change
Traffic volume density	18.4 Mbps/km^2	20 Gbps/km^2	1000 x
Throughput	1.3 Mbps	1 Gbps	770 x
Latency/delay	30 ms	½ ms 1-way	60 x
Availability (downtime)	95% (4320 sec/day)	95% (< 8 sec/day)	540 x

Problems originating in the 5G access backhaul can cause latency, jitter, or packet loss that impacts user experience and satisfaction levels. AAVs need to maintain performance during changing network conditions, as well as support network slicing, edge computing and other 5G advanced services that will come with 5G standalone networks.

Both 5G mission-critical applications and increased video streaming will result in more stringent end-to-end latency requirements and impact the backhaul latency budget. For example, an end-to-end latency cap of 10ms implies a latency across the backhaul that is <1ms. Access providers need to automate problem resolution and optimize service performance end-to-end, plus provide visibility into performance KPI reporting and SLA validation.

Solving AAV 5G access challenges with Accedian Skylight

Accedian Skylight offers the following multi-layered architecture featuring three key elements: sensors, orchestration, and performance analytics. These building blocks help create tailored demarcation solutions for AAVs and a single solution for last mile access, edge compute site, small cell, and hybrid access.

A flexible combination of software agents, hardware-assisted components, virtualized functions and smart SFP hardware comprise its lightweight sensor layer. Unique and truly industry-first, 10Gbps compact SFP devices can be installed at cell sites to enable turn-up testing, bandwidth monitoring and 24/7 SLA performance monitoring, all on a per-service basis.

A virtualized orchestration layer centralizes management and orchestration of the sensors, leveraging local controls and REST API automation. It can also feed data into third-party platforms for planning and troubleshooting. Skylight orchestrator automates the configuration and service provisioning and testing for fast service turn-up.

Skylight performance analytics combines data from all Skylight sensors and third-party sources into a single pane of glass. It offers machine learning-powered alerts and rapid troubleshooting for network and application performance issues. Real-time intelligent monitoring also helps to predict and automate fixes.

Business benefits

- Improve CapEx/OpEx and SLA management
- Single pane of glass for service demarcation and performance KPIs
- Validate traffic is being treated as per the agreed SLA
- Detect service degradations before customers are impacted
- Provide clear “proof of innocence” demarcation and segmentation
- Compare, assess and assure performance to reduce penalties

Space and performance are critical for rolling out 5G's support infrastructure. There is a very limited choice of compact devices that can provide highly precise SLA monitoring, performance assurance and demarcation at 1G and 10G speeds in mobile xHaul and small cells networks. The latency of devices inserted in the data path must be close to zero so that the end-to-end latency of the service is not affected by the introduction of a physical device.

Accedian Skylight's unique high performance, scalable and compact 5G-ready hardware devices combine service demarcation with granular, scalable monitoring and performance assurance for 5G services. These devices, such as the smart SFP, support Layer 2 and 3 services, automated provisioning, testing, and in-service monitoring protocols. They are based on a flexible FPGA architecture optimized for scale and performance that can evolve to meet networking needs.

Skylight analytics is capable of ingesting high volumes of performance data in near real-time that can help monitor all services and customer service level agreements (SLAs) for third-party network providers of Ethernet access and mobile backhaul services. This includes:

- Baselining of performance paths
- Monitoring of change management
- Validation of demarcation services
- Validation of higher speeds and throughputs
- Monitoring of low-latency SLAs for new 5G services

Skylight 5G access benefits for AAVs

- Industry-leading performance: low-latency service demarcation with zero impact on end-to end service performance
- Easy to deploy: automated delivery of new services, activation testing, validation and performance monitoring
- Robust and dependable: continuous performance monitoring regardless of scale and traffic
- SLA reporting: near real-time granular (every millisecond) and high-precision performance metrics and KPIs
- Troubleshooting: Performance data analytics in real time for proactive monitoring and issue resolution

About Accedian

Accedian is the leader in performance analytics, cybersecurity threat detection and end user experience solutions, dedicated to providing our customers with the ability to assure and secure their digital infrastructure, while helping them to unlock the full productivity of their users.

Learn more at accedian.com

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