RAD’s Service Assured Access Solutions

Increase Revenues. Reduce TCO.

With the growing challenges of capacity, over-the-top applications and deteriorating revenues from traditional services, service providers must rapidly introduce creative new offerings while struggling to increase operational efficiency and reduce cost.

RAD’s Service Assured Access (SAA) solutions help business service providers, wholesale carriers and mobile operators to increase their revenues and lower TCO throughout the service lifecycle.

Based on a rich set of tools, RAD’s Service Assured Access solutions make it easier to plan, deploy, provision, and maintain existing and new services, allowing operators to offer a resilient, always-on service with predictable QoS and better QoE.

In addition, RAD provides an economical migration path to virtualization with the Distributed NFV (D-NFV) solution.
Profitable Services

Service assurance has become a “must have” to help control the bottom line:

- Reduce churn through improved service experience
- Fast time-to-market (TTM)
- Premium SLA-based service offerings
- Upselling opportunities
- Fast, “Try-and-Buy” introduction of value-added services

Reduce TCO

- Automated operations
- Reduce truck rolls
- Minimize technician calls
- Faster trouble ticket handling
Any Application

Business Services
- Deliver value-added services with differentiated quality of service/experience (QoS/QoE)
- Predictable performance to minimize SLA violations
- Agile service deployment in remote customer premises

Wholesale
- Clear demarcation to meet SLAs
- Complete visibility and controlled service hand-off

Mobile Backhaul
- Wireless and wireline backhauling for towers and small cells
- Performance validation of leased backhaul connections
- Cost-effective timing synchronization solutions for LTE/LTE-A deployments, integrated with demarcation/aggregation functionality
Service Lifecycle Toolbox

Service Management System
- Pre-installation service planning
- Automatic installation
- Zero-touch configuration
- Auto-inventory discovery
- One-touch service validation
- On-demand remote modification

Performance Monitoring Portal
- Traffic classification
- CIR + EIR traffic policing per flow (CoS)
- Hierarchical scheduling and shaping
- Congestion avoidance mechanism

Fault Management
- L2/L3 performance monitoring
- Scalable long-term KPI collection engine
- One-way delay measurements
- PM dashboard (SLA policies, correlation, violation alerts)
- End-customer PM portal and SLA reports
- Provide OSS visibility to L2/L3 performance data, allowing real-time network optimization

D-NFV Orchestrator
- Managed fault detection and isolation
- Fast detection of loss of connectivity (LOC)
- Ethernet virtual connection (EVC) alarm propagation (AIS and RDI)
- H/W-based fault management
- Wire-speed loopback testing (L2/L3)

Traffic Management
- Traffic classification
- CIR + EIR traffic policing per flow (CoS)
- Hierarchical scheduling and shaping
- Congestion avoidance mechanism

End-to-end Management
- Pre-installation service planning
- Automatic installation
- Zero-touch configuration
- Auto-inventory discovery
- One-touch service validation
- On-demand remote modification

Performance Monitoring Portal
- Collects and presents KPIs
- L2 and L3 performance metrics based on ITU-T Y.1731 and TWAMP
- Threshold policy management
- Performance dashboard with aggregated and drill-down views
- Instant and scheduled reporting
- Immediate detection of service degradation

D-NFV Orchestrator
- Manages the physical and virtual resources for Distributed NFV
- Creates, configures and manages virtual machines on the x86 D-NFV module residing within RAD’s customer-edge devices

Service Turn-Up
- Traffic classification
- CIR + EIR traffic policing per flow (CoS)
- Hierarchical scheduling and shaping
- Congestion avoidance mechanism
Any Service

- MEF-certified Carrier Ethernet 2.0 services
- Standard manageability, multi-CoS services and carrier interconnection
- Advanced capabilities for L2 service delivery and assurance

- Integrated L2/L3 demarcation
- Flexible IP service deployment with multi-VRF (virtual routing and forwarding)
- L3 service monitoring with TWAMP

- TDM service emulation
- Standards: CESoPSN, SAToP, CESoETH (MEF-8)

- Distributed IEEE 1588v2 Grandmaster
- Synchronous Ethernet
- Built-in GPS
- IEEE 1588v2 TC/BC and slave for frequency and phase
- Hybrid Sync-E and 1588 ToD

- Rapid introduction of VAS at the customer premises
- Fast deployment/upgrade of network functionality at the customer premises
- Combine L2/L3 demarcation with standard virtual machine (VM) platform
- Spectacular savings with invest-as-you-grow scalability
- No changes to existing OSS/BSS and architectural environments
Any Deployment Mode

Choose the Deployment Mode that Is Right for You:

**Complete SAA Network**
A complete Carrier Ethernet access solution, including smart demarcation and Ethernet service aggregation devices deployed in linear and ring topologies.
Implement service assurance across the entire access network, between customer locations for VPNs, across an Ethernet transport domain for mobile backhaul, inter-carrier connectivity, IP VPN and internet access, between data centers, and over-the-top (OTT) cloud services.

**SAA NTUs (for Existing Networks)**
Add Service Assured Access capabilities to your network with RAD’s intelligent Carrier Ethernet demarcation CPEs. Provision, monitor and manage your services end-to-end over your existing packet switched network.

**On-Site SAA Upgrade**
Get instant Carrier Ethernet functionality for your existing network elements, such as switches, routers, DSLAMs, cellular cells, and Ethernet converters, using MiNID. RAD’s miniature NID in an SFP sleeve. Plugging MiNID into these devices is a fast and easy way to implement L2 and L3 PM capabilities and service demarcation in non-Carrier Ethernet equipment.
Your Benefits:

- Easily plan, deploy, provision, and maintain SLA-based services with the same “look and feel” over fiber/copper/TDM/wireless access
- Carrier Ethernet demarcation switch with integrated L3 router functionality
- MEF CE 2.0-certified with a feature-rich toolkit: RFC-2544/Y.1564 testing, multi-CoS traffic management, fault management, Y.1731/TWAMP performance monitoring

- Enhanced service provisioning, visibility and reporting using RADview Service Manager and Performance Monitoring portal
- Built-in Distributed NFV for service agility and premium offerings at the customer edge
- Instant upgrades to existing equipment with MiNID service assurance booster
Your Benefits:

- Service assurance across different network segments and end-to-end by deploying RAD devices at the customer edge and carrier interconnection points
- Multi-CoS Carrier Ethernet services with the same “look and feel” over fiber/copper/TDM/wireless access
- Fast time-to-market and service rollouts for higher revenues, using standardized E-NNI attributes
- Lower TCO with an extensive service management and monitoring toolset, as well as automatic provisioning and troubleshooting
- Improved service visibility and SLA reporting with RADview Performance Monitoring (PM) portal
- Built-in Distributed NFV for service agility and premium offerings at the customer edge
- RAD’s global presence and extensive partner network for local support
TDM Services over Packet Networks

Your Benefits:

- Maintain legacy TDM services over new packet network to keep revenue flow and customer loyalty
- Enable alternative providers to add leased lines to their service portfolio to attract new customers
- Support heterogenic First Mile footprint requiring CPE support for DSL/EFM, active Ethernet, GPON connections, and flexibility in PWE termination options: customer site-to-customer site; customer site-to-POP/network; POP-to-POP
- Allow a single transport network for IP/Ethernet and TDM services to simplify operations and lower TCO
Hybrid TDM and Ethernet Access

Your Benefits:

- Dual TDM and Carrier Ethernet processing engines allow the same CPEs and aggregation equipment to be used throughout the migration process over DSL, fiber, E1/T1, wireless, or Carrier Ethernet.
- Deliver legacy applications alongside new offerings using the same access link to reduce costs and increase efficiency.
- Agile, seamless introduction of Ethernet/IP services over existing SDH/SONET.
- Optional offload of Ethernet traffic to PSN, while TDM traffic is kept over SDH/SONET core.
- TDM pseudowire ensures service continuity for legacy applications and equipment.
- Avoid costly maintenance of obsolete TDM network equipment.
- Service Assured Access solution enables Metro Ethernet Forum's Carrier Ethernet 2.0 services.
- Next-generation services with D-NFV.
Cloud Connectivity

Your Benefits:
- Offer compelling and competitive cloud services that meet enterprise customers’ traffic volumes and QoE (quality of experience) expectations
- Increase revenues by offering premium cloud connectivity services with SLA monitoring
- Improve QoE per application with multi-CoS support, L2 and L3 performance measurement, visibility and fault management
- Lower OpEx with per-CoS ongoing quality monitoring of the access link
- Aggregate SLA-based cloud services using a central cloud access demarcation device, with advanced traffic management tools and high scale performance monitoring
- Built-in Distributed NFV for service agility and premium offerings at the customer edge
Wholesale Networking

• Provide wholesale Carrier Ethernet transport services to multiple service providers with complete visibility and controlled service hand-off between multiple networks
• Demarcation for business, mobile and DLSAM backhaul over the same transport network
• Provide SLA-based backhaul all the way to the end-customer site, cell site or POP
• MEF-certified Carrier Ethernet 2.0 E-Access support with single-CoS and/or multiple-CoS EVC/OVC for standards-based carrier-to-carrier connectivity
• Seamless connection between networks with 1-GbE and 10-GbE E-NNI interfaces with optional redundancy
• Instant upgrades to legacy switches, routers and third-party equipment with the MiNID service assurance booster

Your Benefits:

Applications
Applications

Your Benefits:

- Control mobile backhaul SLAs for macro and small cells
- MEF Carrier Ethernet 2.0-certified and multi-CoS traffic delivery with service management and OAM-based diagnostics
- Performance monitoring for L2-based and L3-based backhaul
- Integrated Carrier Ethernet with TDM pseudowire in the same device
- Ensure service visibility and control for small cells, while meeting space and power consumption restrictions
- Timing distribution including an integrated GPS; highly accurate phase (Time of Day) and frequency synchronization using standard IEEE 1588v2 Grandmaster and/or Sync-E technologies
- MiNID miniature NID helps normalize mobile backhaul transport network with diverse access architectures
- Add-on functionalities with D-NFV
Performance Monitoring for Mobile Networks

Your Benefits:

- Performance monitoring for L2-based and L3-based backhaul services
- PM controller functionality supports Y.1731, TWAMP and ICMP Echo ("ping") opposite RAD devices or third party responders
- Ensure service visibility and control for small cells and macro cells while meeting space and power consumption restrictions
- Add-on functionalities with D-NFV
- Verify backhaul performance with service activation tests (Y.1564)
- RADview Performance Monitoring portal for SLA reporting with aggregated and drill-down views per PM session
- Instant upgrade of existing backhaul networks to deliver full visibility and control over service experience, independently of installed base capabilities using MiNID