



Federadius is a high performance, carrier-grade RADIUS AAA and policy enforcement server, providing real-time shaping, QoS and bandwidth management for millions of simultaneous users.

#### Introduction

Combining extremely high authentication rates with a federated, fault tolerant and vendor neutral architecture, Federadius is designed to provide authentication, accounting and policy enforcement services for millions of simultaneous end-users, while being resilient to major network, hardware and software faults and outages.

Federadius is an ideal solution for large-scale, mixed-vendor DSLAM, LNS and Wifi hotspot data networks, and any other RADIUS based subscription data network deployed at scale.

#### **Authorization and Policy Enforcement**

Federadius makes real-time enforcement of shaping, walled garden, QoS, ACL, bandwidth and other network access policies easy. The server supports an unlimited number of policy enforcement combinations for millions of active subscribers in a dynamic, wide area, real-time, multi-vendor access server environment. It synchronises CoA, DM and Request/Accept messages and provides a simple, real-time policy enforcement interface to BSS and OSS systems.

### Compatibility

Federadius transparently manages RFC 5176 dynamic policy extensions and supports CoA, DM, and associated authorisation responses. The very high performance RFC 2865/2866 AAA server, coupled with DM provides a low latency policy enforcement mechanism for equipment which does not support CoA.

For equipment which does not support either DM or CoA, Federadius provides a dynamic authorisation function which can be combined with an external connection reset operation performed using other protocols (such as SNMP).



### Architecture

The Federadius architecture consists of three major components: the FFE, FSC and CDB.

Federated Front End (FFE) servers are intended to be deployed physically close to network access servers including LNS, BRAS, softswitches and base stations. Proximity to the access servers improves authentication performance while also allowing resilience during a network partition. FFEs make all initial authentication and authorization decisions locally, decoupling the process from external databases while providing incredible realtime performance. Multiple FFEs can be co-located in each POP, or access servers can be configured to use non-local FFEs as redundant backup servers. Federated Session Controller (FSC) servers operate from centralised locations such as regional data centres. These servers are in charge of session management and accounting, and provide concurrency control. FSCs and FFEs are not dependent on one another; authentication can continue even if all FSCs are unreachable; accounting will be updated, with no lost records, once the FSCs come back online.

**Configuration Database (CDB)** servers are non-critical configuration repositories incorporating a web-based management tool for configuring the Federadius cluster. Configuration is dynamically pushed to all FFEs and FSCs as it is updated, ensuring that Federadius is fully tolerant of CDB server faults.



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## **Vendor Neutral**

Federadius dramatically simplifies policy enforcement in mixed-vendor environments. Policies and enforcement settings are configured in the form of RADIUS AVPs and VSAs for each vendor; your BSS or other external system simply sends the subscriber ID and policy ID to Federadius.

Federadius automatically determines the correct AVP/ VSA pairs to send to the NAS based on the subscriber's connection at the time. If a subscriber is connected to multiple NASes simultaneously, then each NAS will receive the appropriate AVPs - even if the NASes are not the same vendor. This solution is ideal in wireless environments such as mixed WiMAX and WiFi networks.

# **Shared Sessions**

Unlike typical RADIUS federation using LDAP or shared configuration files, Federadius provides a dynamic, shared session architecture between RADIUS front ends. This architecture provides seamless redundancy which preserves session and policy state and ensures accurate data metering and policy enforcement - even in the face of server, network or software failure.

This shared session architecture enables dynamic, real-time, federated enforcement of policy changes at any time, for any number of subscribers, using a simple, central API.

## **Configuration and Integration**

Federadius is designed to integrate seamlessly into an existing OSS/BSS environment.

User provisioning and policy enforcement is performed via a real-time SOAP API, which enables easy integration with existing BSS and Policy Management Engines.

Static configuration is provided by the Federadius Configuration Database, which provides a portable XML configuration format to support the development, test, staging and deployment scenarios required for carrier deployment. Configuration can be performed using the included web user interface, integrated with a configuration database, or via the simple configuration API. Federadius provides a stream of de-duplicated, normalised delta accounting records to the BSS via the enterprise messaging bus, for rating and billing.

Of course, Federadius also includes out-of-the-box integration with Inomial's BigRating engine and the Smile Billing Suite to provide a turnkey billing, authentication and accounting system for ISPs.

# **Fault Tolerance**

The Federadius architecture provides reliability far beyond surviving single points of failure.

Each high-performance front-end RADIUS server can authenticate users independently of any other network element. Even a major outage affecting multiple data centres will not affect the FFE units, allowing customers to continue using the network.

# **Technical Specifications**

Authentication Rate	> 1,000,000 / minute / node
Response Latency	< 6ms / request
Subscriber Limit	> 1,000,000 sessions / node
Maximum Cluster Size	No limit
Availability Target	99.999% per node
Compatibility (RFCs)	2865, 2866, 2867, 2868, 2869, 3162, 5090, 5176
API	Soap, JMS

## **Related Products**

BigRating: our advanced real time event billing engine.

**Smile:** Automatic Accounts Receivable<sup>™</sup> is a real-time, zerotouch solution for receivables, collections, commission and debtor policy management, with an emphasis on integration, automation and zero-touch operation.

**Flow Control:** distributed NetFlow and SNMP polling and data aggregation for carriers.