



# **ARADIAL RADIUS**

Product Overview including Wimax

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<http://www.aradial.com>

<http://www.radius-server.com>

<http://www.wifi-radius.com>

## Document Information

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## Product Overview

Aradial is a high performance full-featured RADIUS server. Boasting excellent performance and technological superiority, Aradial is the unquestioned market leader in its class.

Extensive support for: **ISP, Wireless LAN, VoIP, GPRS and Wimax providers.**

The server includes some of the most innovative features available in the market today. It is easy of use, scalable and features a plug-in architecture providing support for almost any new functionality or network element.

Aradial's 100% web-based interface ensures easy connectivity from anywhere. Coupled with a state server that enables to monitor what is happening in the network, in real time, Aradial turns a web browser into the ultimate remote control.

Through an easy to use scripting interface fail over mechanisms can be applied, some resources can be dedicated for particular end users, time of day decisions on network load can be made, and much more.

Using policy algorithms, Aradial can implement rule-based authentication giving a complete manageability of network resources.

Aradial is vendor independent and conforms to the Wimax NWG standard. The following ASN-GW vendors has already been tested for interoperability with Aradial: Alvarion, Wichorus (Tellabs), Gemtek, ALU, Huawei, Starent and Runcom.

Aradial is vendor independent allowing to use Cisco's access servers including Wireless LAN (Aironet series) , Ascend's MAX Series, Lucent's Portmaster, Bay's, Shiva's, any combination of them or any other RADIUS enabled product.

Wireless Security Suite: Extensible Authentication Protocol (EAP), 802.1X, EAP, and Protected EAP (PEAP).

Wimax security suite: EAP-TTLS and EAP-TLS with MSK and EMSK key generation.

Aradial can use its own user database, an external ODBC compliant database or use a LAN user database with Aradial LAN to WAN permissions mapping mechanism, without any duplicate user database hassles.

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Support for connection to LDAP, allowing maintaining a single centralized user database.

Additionally, the server's full list of administrative and reporting utilities make it a single point of control.

Aradial's advanced proxy support allows transparent operation in even the most complex of network environments.

Advance connectivity to tier one billing systems both in Postpaid and Prepaid market such as: FTS (fts-soft.com), Ushacomm and Amdocs Compact Convergence.

Aradial, a powerhouse of features and performance is affordably priced and ready to download for an evaluation today.

### **Reliability and scalability**

Aradial RADIUS is a true performed with Tier 1 (99.997%) reliability and scalability to comfortably support over a million subscribers. Though installed and suited to serve the largest providers, the Aradial RADIUS is high performing and therefore requires low cost hardware, supporting most service providers' requirements on a commercial Pentium machine.

### **Web based administration**

Aradial RADIUS turns the web browser into a remote control. The server can be accessed from anywhere in the world over secure SSL, with no client side installation what so ever. All needed is a web browser in order to configure RADIUS settings from anywhere, view all currently online sessions, modify the subscriber record, and more.

### **Support for the latest RFCs**

Aradial software supports the latest RADIUS RFCs, supporting xDSL services, vendor specific attributes and a host of other features such as predefined attribute check lists. Aradial's experience in the RADIUS and billing market means that you are guaranteed a solution that will continue evolving into the future.

Aradial Radius is compliant with the following RADIUS RFCs:

- RFC 2865 -- Remote Authentication Dial-In User Service (updated by RFC 2868)
- RFC 2866 -- RADIUS Accounting (updated by RFC 2867)
- RFC 2869 -- RADIUS Extensions
- RFC 2548 -- Microsoft Vendor-Specific RADIUS Attributes
- RFC 2809 -- Compulsory Tunneling via RADIUS
- RFC 2868 -- RADIUS Attributes for Tunneling Support
- RFC 2882 -- NAS Requirements: Extended RADIUS Practices
- RFC 2619 and 2621 -- Radius Authorization and Accounting SNMP
- RFC 3748 -- Extensible Authentication Protocol (EAP)

- RFC 3579 -- RADIUS EAP
- RFC 2716 -- EAP TLS
- RFC 2759 -- MSChap V2
- RFC 3576 -- Dynamic Authorization Extensions

### **Full support for Secure Wireless RADIUS**

Hot Spot Server for wireless includes an integrated RADIUS server that is particularly suited for the security and authentication requirements of wireless based network including:

EAP based authentication – EAP-MD5, EAP-TLS, EAP-TTLS, and EAP-PEAP

MAC Address based authentication

IEEE 802.1x based WEP security

### **Support for Wimax**

Aradial supports the Wimax Forum Network Architecture Stage 2 - 3: Release 1, Version 1.4, including:

- Wimax VSA's with C bit support
- Structured attributes with sub TLVs
- MSK and EMSK key generation
- Flow and session based accounting
- Wimax Capability Negotiation
- CoA for hotlining
- Wimax quota based prepaid using the PPAC and PPAQ attributes
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## Aradial RADIUS Basic Features

### Authorization policy support

Out of the box support for authorization based on time of day, caller ID. A Checklist mechanism allows to accept/reject an authorization based on any RADIUS attribute on the access requests. Aradial flexible policy mechanism allows implementing of authorization policies for additional non-user specific parameters like any RADIUS attribute (like location), or other parameters, provided they are available to the RADIUS server.

An embedded TCL scripting language (configuration) can be used for the above without coding.

### Authorization policy support (2)

Support for authorization based on time bank and mega byte bank, account status, password lockout mechanism. Other user specific, non profile parameters can be added using the flexible policy algorithm mechanism, using TCL scripts or C++ shared libraries.

### Data stores

Support for the following user policy databases: Oracle, SQL Server, MySQL or LDAP.

### Catalog management

New services can be added using Aradial implementation. The service definition includes static authorization parameters, while personalized authorization parameters are flexibly defined as part of the user profile.

### IP address management

Aradial provides out of the box support for IP pool management.

### Record format

Every RADIUS attribute can be written to the usage detail records. All attributes are defined using dictionaries. There is a default dictionary and vendor specific dictionaries. The dictionaries can contain native RADIUS attributes or vendor specific attributes (VSA's).

### Record editing

The format of the usage detail records (CDR's) is defined using a configurable text file. Therefore, it is possible to define specifically which attributes will be written to the CDR files.

### Prepaid capabilities

The RADIUS server cannot proactively interrupt a session. It is the network element responsibility to monitor the user usage and call the RADIUS server for re-authentication for each quota. The RADIUS server can allocate duration or volume quota from a duration or volume bank. For a full prepaid, integration with an online charging billing system is required (prepaid system).

### Fraud management

Support for limiting the number of concurrent simultaneous sessions at the user or group level. The limit may be to a single session or to a specified number of concurrent sessions. Support for password lockout. Support for authorizing a user based on his caller ID

### Record standards

Comma delimited files and flexible text file format defined by a configuration template. Also CDRs can be written to a relational database. Using the internal scripting language the records can be written to any format.

### Usage interface

Aradial relies on the mediation/billing system to pull the CDR files. FTP or socket transfer of CDRs can be developed in customization.

### Accounting flexibility

The accounting can be customized using the flexible policy algorithms or the embedded TCL scripting language (can format the output).

### Interfaces and APIs

Standard interfaces described in a previous item (AAA standards).

We have the following customer management API's:

- a. Using HTTP / REST
- b. Using TCP/IP provisioning.
- c. SOAP.
- d. Customized - you can request an API and we will provide it.

### Hardware and OS

Hardware supported: Any server running the supported operating systems.

System software: Windows and Linux.

### Architecture scalability

Aradial supports vertical scalability using multi-threaded architecture and providing linear scalability. Horizontal scalability is supported using multi server deployment of Aradial.



### Solution performance

- Aradial can support millions of users in one Oracle database or LDAP server.
- Millions of concurrent sessions.
- The performance depends on the database performance and storage.
- Using Oracle native OCI API and reuse of statements.
- Special treatment to partition the accounting log into separate tables (also the native Oracle 9i partitioning can be used)
- All the reference data is cached in the memory of the server.

### Interoperability

Interconnecting with iPass and GRIC and many other RADIUS vendors (RADIUS proxy).

### Monitoring and management

- Monitoring of active sessions.
- RADIUS server statistics.
- Full management and administration capabilities using a web based user interface.
- SNMP monitoring based on RFC 2619 and 2621.

### Uptime and availability

- Ability to perform online load (reconfiguration without restart) of major configuration elements (like NAS definitions, user group definitions). Several parameters will require a restart.
- Database high availability using Oracle RAC or SQL server replication / cluster or MySQL replication / cluster..
- AAA server high availability using multi process deployment.

### Logging

- Support for multiple log topics (like Severe, Warning, Info, Debug, SQL Info, Etc.).
- Ability to configure each log topic separately. Also ability to reconfigure without restart of the server.
- Logs can be written to the following targets: local files, Windows event log or Syslog.

### Reporting

Online Statistics:

1. Online Graphs: Daily, Weekly, Monthly, Yearly, and all time average.
2. Different Types: Logins, Simultaneous Sessions
3. Different Axis: By Group, By NAS and Total
4. Full SNMP support.

Online Sessions: View all Online Sessions with detailed information of UserID, IP, Online time, Origin and more.

Admin Reports:

1. Administrator Reports delivered to you by Email on a daily, weekly or monthly basis.
2. Different Report Types: Summary and Group.

### Fault tolerance

The Radius server is stateless, where all session data is stored in a relational database (active sessions and IP pools). The use of Oracle Real application cluster enables the fault tolerance.

Database storage will use RAID and virtual storage for H/A (EMC or Veritas).

Using 3<sup>rd</sup> party monitoring and keep alive tools from EMC, Veritas, Next Nine, etc.

Each Radius server can be configured to use **two** database connections; if one fails the other would be used (based on Oracle RAC).

### Fault management

- Full SNMP support for the Radius server.
- Implementation of RFC 2619, 2621 (RADIUS-AUTH-SERVER-MIB and RADIUS-ACC-SERVER-MIB).
- Supports sending TRAPS to the network administration tool via SNMP.

### Dynamic Authorization

- Packet of Disconnect
- Change of Authorization