

# Innovative AAA and Billing solutions for converged networks deployment with MikroTik Router OS

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Aradial Technologies and Spotngo Wireless.



# Aradial Technologies

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- Servicing small and large Service Providers since 1997.
- Specializing in converged AAA solutions for Vertical Markets primarily ISP, ASP, WISP, Cable, DSL, Mobile and VOIP.
- Our team is composed of experienced personnel from leading networking and billing companies.
- Self funded and private company trusted by NASDAQ traded Service Providers.
- Partnered with leading Billing and gateway companies to offer end to end solutions.
- Global network of VAR and distribution network.

# Aradial Radius Overview

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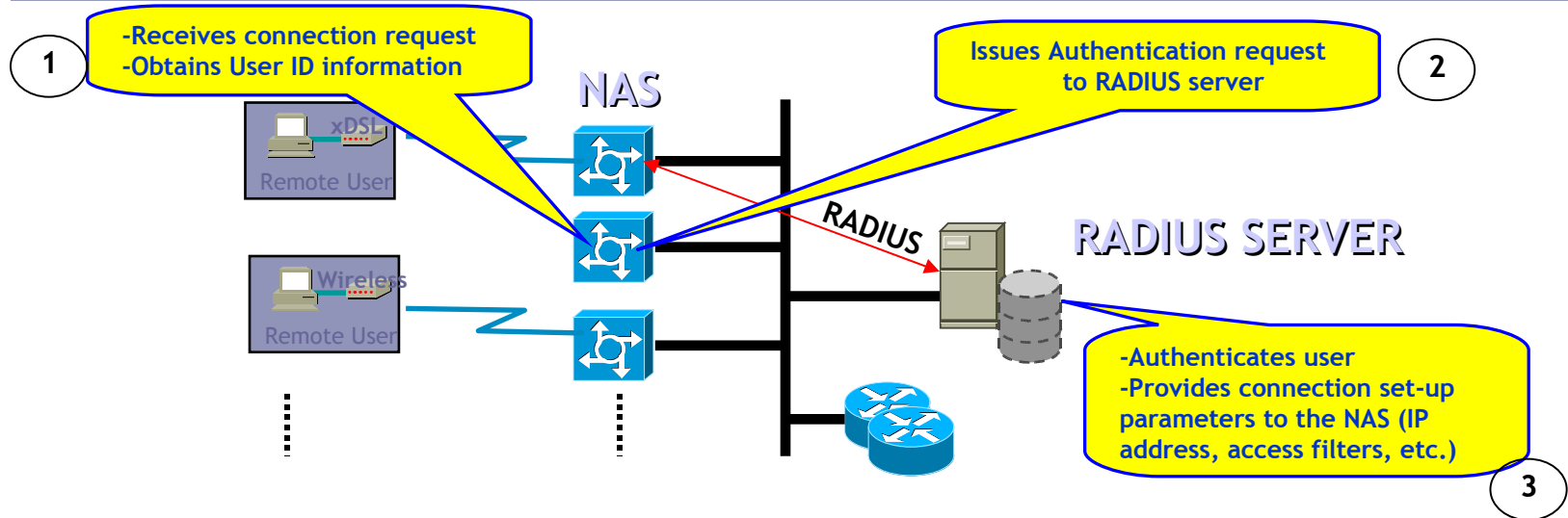
- High Performance and full featured Radius Server
- Supporting dial-up, xDSL, VOIP, Wireless LAN, and Mobile IP (GPRS/EDGE/3G)
- Supported OS include Solaris, Linux and Windows.
- Standards based Authenticating, Authorization and Accounting (RFC 2865, RFC 2866)
- Scalable supporting multi process and multi threading.
- High Availability
- Easy provisioning

# Aradial Radius Overview – Cont'

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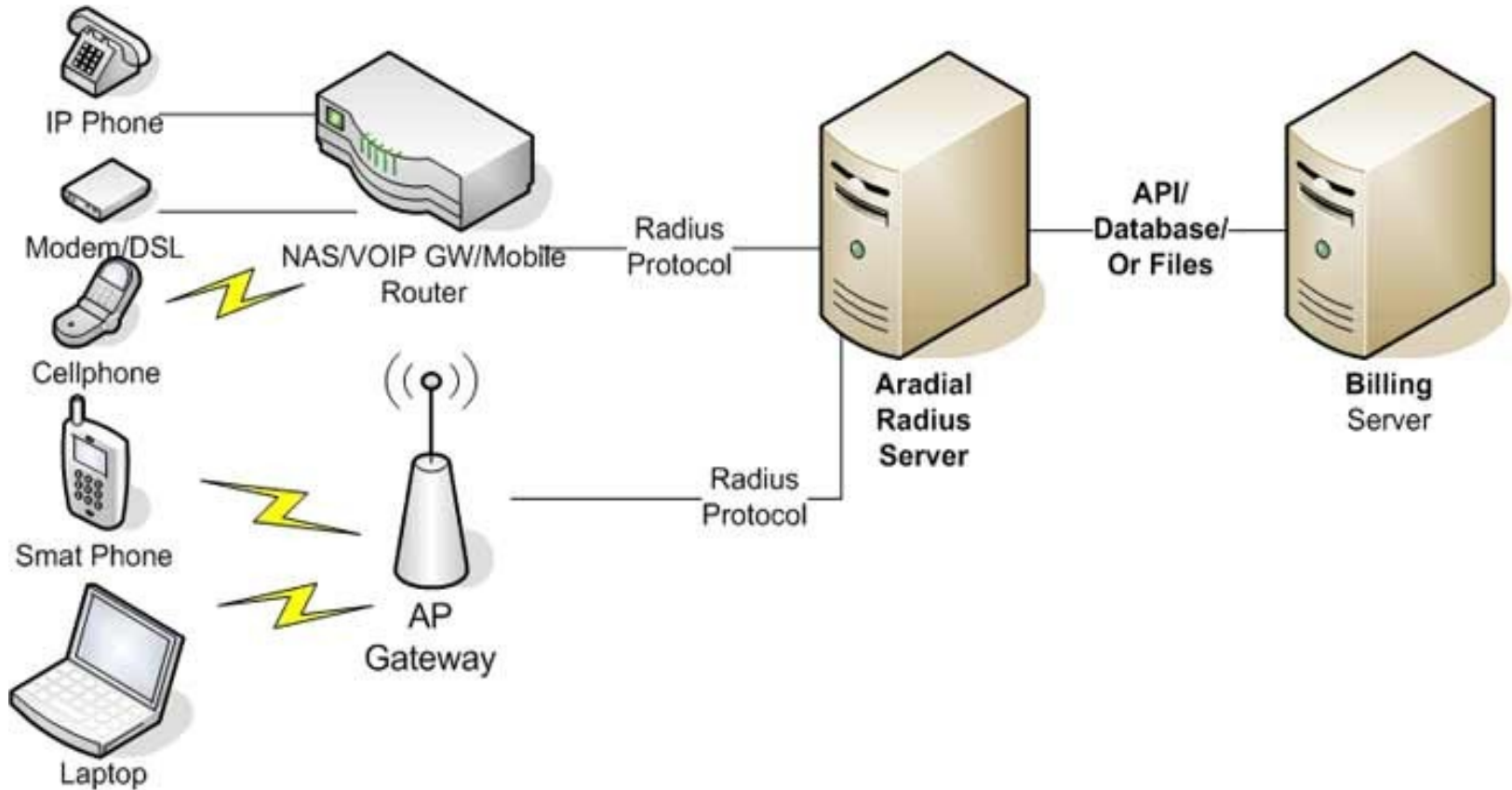
- 100% web-based interface ensures easy connectivity from anywhere. Supports SSL.
- Database support
  - ODBC (Access, MS SQL, mySQL, Oracle)
  - Native Oracle (OCI)
  - LDAP
  - NT & Active Directory user authentication
  - Flat files
  - SecurityDynamics SecurID
- Statistics and reporting modules
- Prepaid cards, bank and balance enforcement

# RADIUS Access Control Model

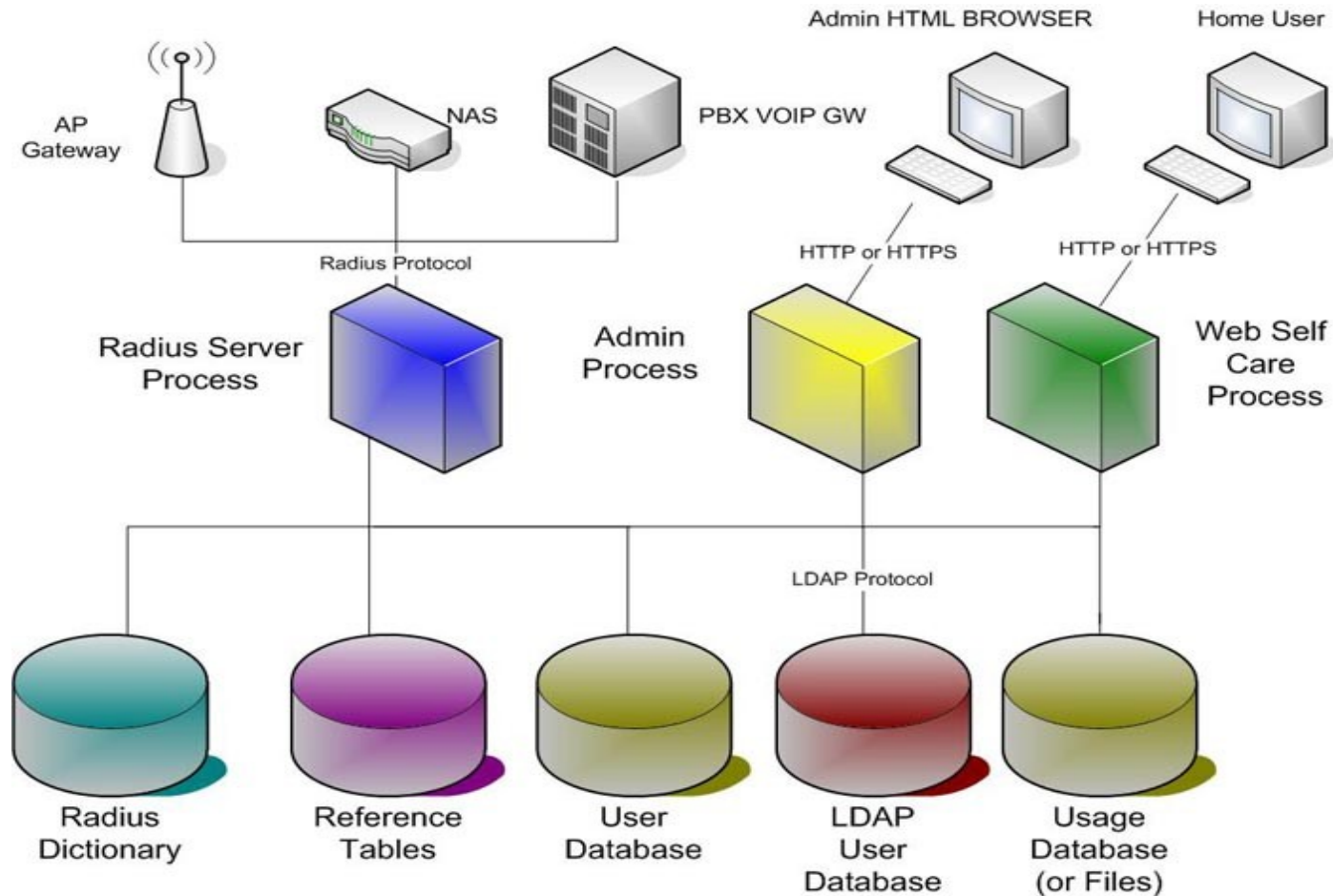


- Long established, widely adopted, broadly interoperable protocol established originally for access to remote computers
- RADIUS is the de-facto AAA protocol being used in the industry
- Technology has matured to include accounting control; data feed to back-end systems for billing, monitoring and reporting
- Centralized authentication and authorization of users provides network security and centralized management and access control.

# Simplified Network Deployment

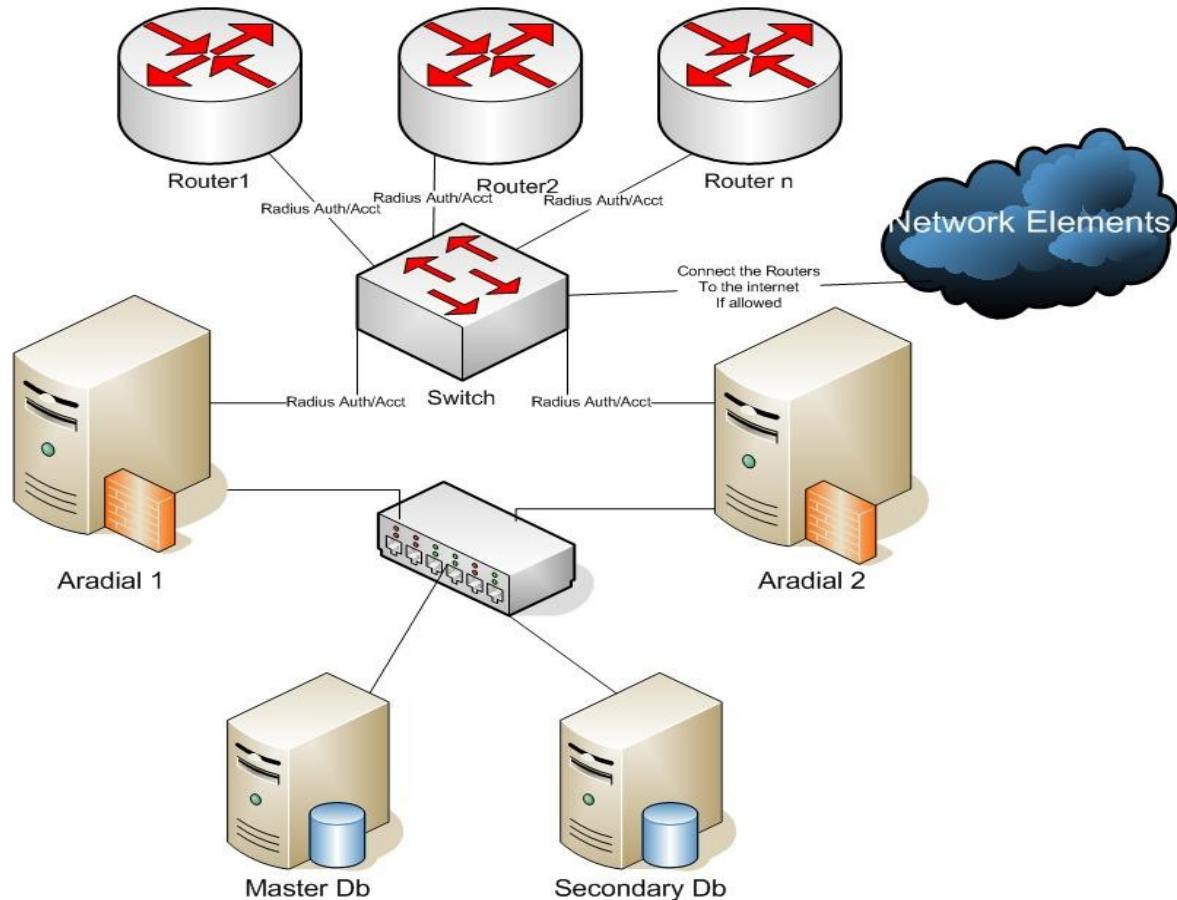


# Aradial Architecture



# High Availability Deployment

outers Network Diagram - Redundant





# Supported IP Services

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- Mobile
  - (E)GPRS, WAP
  - CDMA 2000 and 3GPP dictionaries
- Any broadband, xDSL or Cable
- WiMax
- Mesh Technologies
- Wireless LAN support
  - EAP in accordance with RFCs 2716 and 2246
  - EAP in accordance with RFC 2284

## **Supported IP Services - Cont'**

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- **VOIP Gateways support**
  - Cisco GW, Quintum Tenor, Alcatel and others
  - GNUGK
- **Sip Proxies**
  - Cisco SPS
  - Mailvision
  - NextGK
  - All others that support standard SIP VSA

# Aradial Billing Systems Integration

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- Advanced API for external online charging/billing servers using CORBA
  - Session Duration Limitation
  - Data Transfer Limitations – directional limiting supported
  - Bandwidth Limit – using VSA RADIUS Attributes
  - Quota Based Access
  - QoS and Subscriber Profile
- Export usage to billing systems
- Enhanced provisioning APIs
- Internal support for traffic, duration metering & QoS
- Billing Integration through stored procedures

# Policy Algorithm Mechanism

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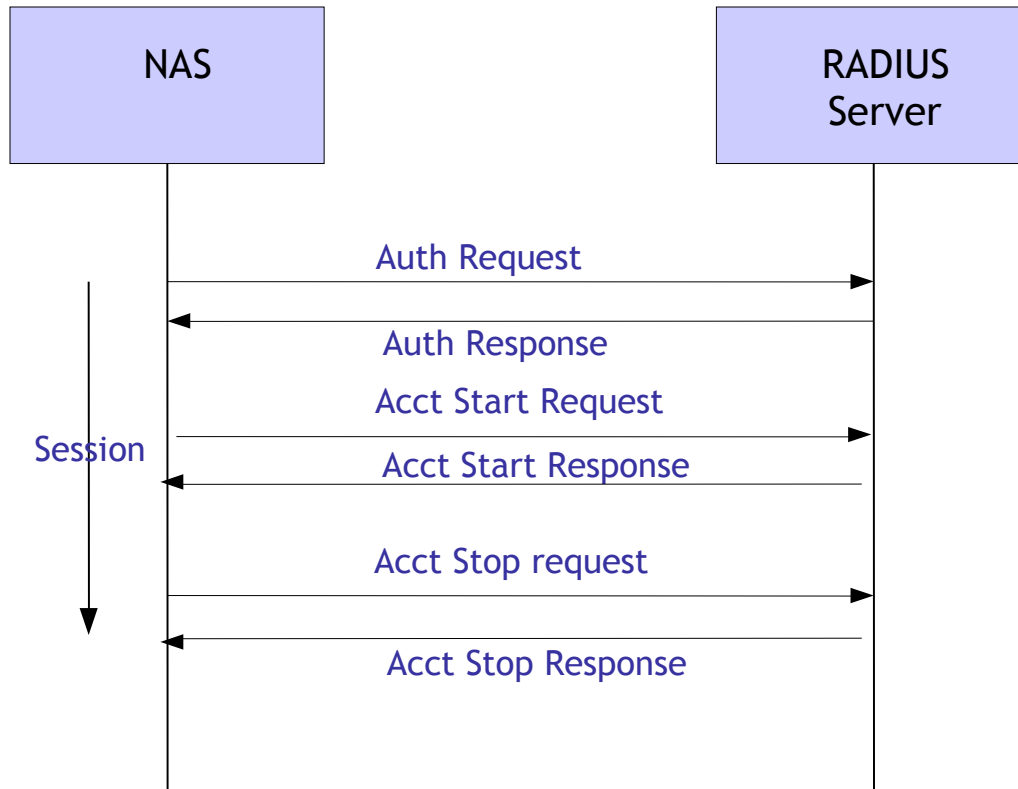
- Customizable handling flow for each RADIUS message type
- Flow is made of a chain of RADIUS algorithms
- Core algorithms supplied with the product
  - Authentication & Authorization algorithm
  - Several accounting algorithms
  - RADIUS Proxy algorithm
- New algorithms can be developed using C++ shared libraries and/or TCL scripting

# Unique Functionality

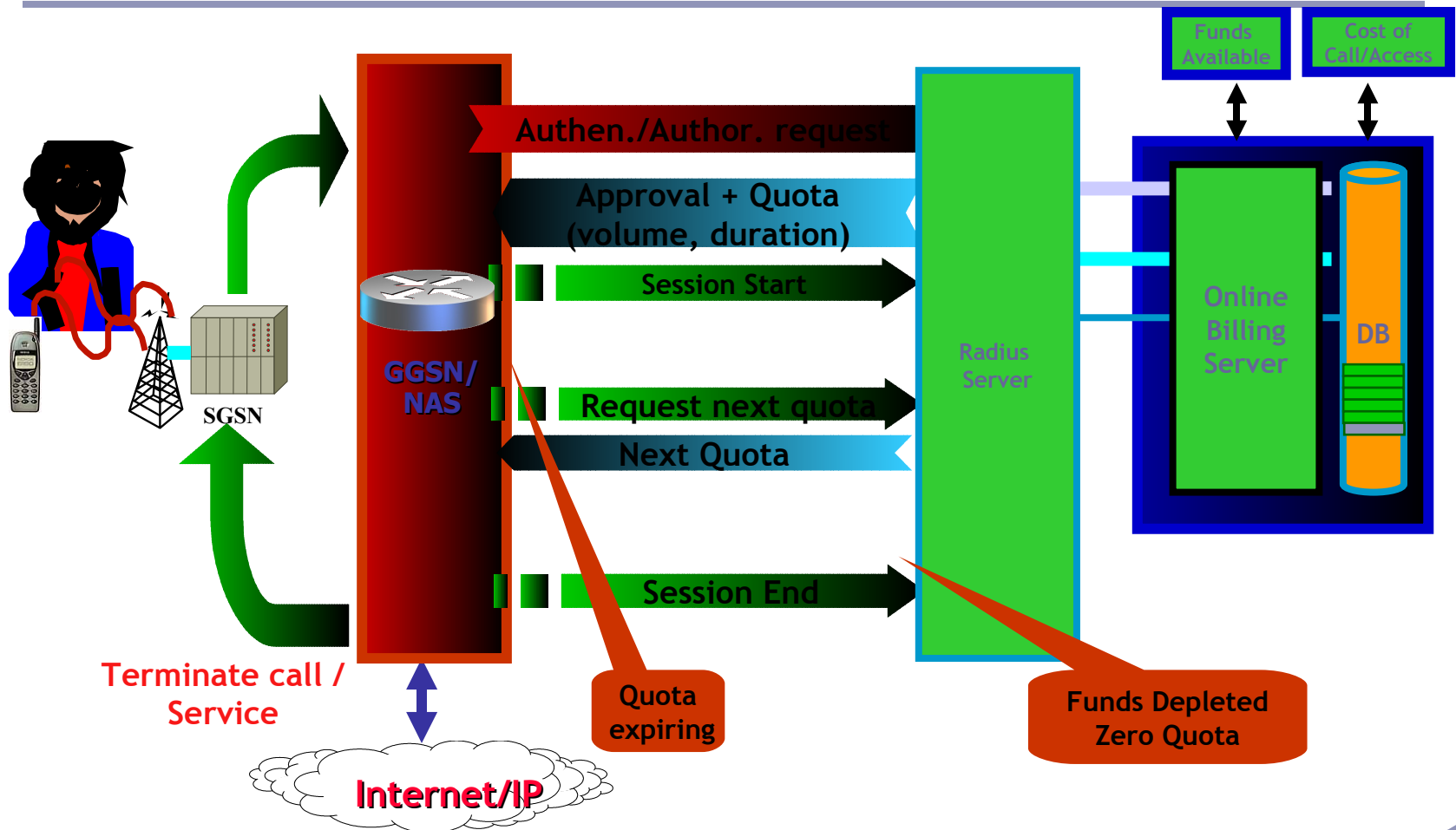
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- TCL scripting for Policy Algorithms
- Extended billing server connectivity API
- Grouping and Sub Grouping
- Persistent IP Pools (support H/A)
- Metering (on external billing database) -
  - Time and data accumulator
  - Triggers for blocking or changing QoS based on accumulator
- Block or change QoS for Groups in Time-of-Day periods (e.g. peak, off-peak configurations)
- Dealers and affiliates support
- Capable of running multiple RADIUS servers on single Hardware

# Radius Session Flow



# Quota Based Billing and Online Billing Servers.



# Aradial Web Admin

Aradial

**Summary** Last update: **May 30, 2007 at 23:35:17**

Service Provider: **spotngo**.  
Users on-line: **0** ([show](#)).  
Users In the database: **8** ([show](#)).  
Network Access Servers configured: **1** ([show](#)).

License Number:	Demo0407
Licensed to:	Demo0407
Server Status:	On-line
Server Up Time:	00d 00h 13m
Server Version:	3.5
Users (Overall/Concurrent):	20/10

**Aradial evaluation expired. Server will stop honoring requests after 30 minutes..**

s. Server is online - (0/8 users connected)

**Session 1-Hour Statistics**

0- 10-  
-  
0- 40 45 50 55 0 5 10 15 20 25 30 35

Server Online Stop << Back Refresh



# Aradial User Manager

Aradial

**Users**

[Add](#) [Edit](#) User  
[Add](#) [Edit](#) Group  
[Add](#) [Edit](#) Dealer  
[Add](#) [Edit](#) Tariff Plan  
[Add](#) [Edit](#) Tariff Table 1  
[Add](#) [Edit](#) Tariff Table 2  
[Add](#) [Edit](#) Tariff Table 3  
[Add](#) [Edit](#) Tariff Table 4  
[Add](#) [Edit](#) Tariff Table 5  
[Add](#) [Edit](#) Tariff Table 6  
[Add](#) [Edit](#) Tariff Table 7  
[Add](#) [Edit](#) Tariff Table 8  
[Add](#) [Edit](#) Tariff Table 9  
[Add](#) [Edit](#) Tariff Table 10

[View Sessions](#)

[< Back to Main](#)

[Online Help](#)

User ID	First Name	Last Name	Time Bank	KB Bank	Balance	Expiration Date	Group Name	EMail	Action
<a href="#">DemoUser1</a>	Frank	Young	0:10:00	0	0.0000		Analog	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">DemoUser2</a>	Carl	Baker	0:00:00	0	0.0000		MultiLink	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">mum001</a>	mum001	mum001	1:00:00	0	0.0000		Wifi	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">mum002</a>	mum002	mum002	1:00:00	0	0.0000		Wifi	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">mum003</a>	mum003	mum003	1:00:00	0	0.0000		Wifi	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">mum004</a>	mum004	mum004	2:00:00	0	0.0000		Wifi	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">mum005</a>	mum005	mum005	2:00:00	0	0.0000		Wifi	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">voip046606</a>	voip046606	voip046606	0:00:00	0	5.0000		VOIP	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">voip405255</a>	voip405255	voip405255	0:00:00	0	5.0000		VOIP	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">voip757448</a>	voip757448	voip757448	0:00:00	0	5.0000		VOIP	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">VoipUser1</a>			0:00:00	0	100.0000		VOIP	<input type="checkbox"/>	<input type="checkbox"/>

[EMail](#) [Delete](#)

[EMail All](#)

Server Online
Stop
[<< Back](#) [Refresh](#)

# Aradial Web Self Care

## Aradial User Self Care

[User Summary](#)

[Update User](#)

[Change Password](#)

[View Sessions](#)

### Personal Information

<b>First Name:</b> Frank	<b>Last Name:</b> Young
<b>Company:</b> Food Inc.	<b>E-mail:</b>
<b>Address 1:</b> 23 Baker st	<b>Address 2:</b>
<b>City:</b> New York	<b>State:</b> NY
<b>Country:</b> USA	<b>Zip:</b> 1234
<b>Home Phone:</b> 555-0418	<b>Work Phone:</b> 555-1075
<b>Fax:</b>	
<b>Custom Info 1:</b>	<b>CUstom Info 2:</b>
<b>Custom Info 3:</b>	<b>Custom Info 4:</b>

### Access Information

<b>User ID:</b> DemoUser1	<b>Status:</b> OK
<b>Caller ID:</b>	<b>Callback Number:</b>
<b>Group Name:</b> Analog	

### Additional Access information

<b>Service:</b> <None>	<b>Filter:</b>
<b>Remote IP:</b>	
<b>RADIUS Attributes:</b>	

### Dates

<b>User Creation Date:</b> 05/23/99	<b>User Activation Date:</b> 05/23/99
<b>User Expiration Date:</b>	<b>Last Login On:</b>

### Metering Information

<b>Time Bank:</b> 0:10:00	<b>KB Bank:</b> 0.000
<b>Balance :</b> 0.0000	

# Spotngo Payment Module

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- Integrates with Aradial to offer powerful prepaid service, yet simple to deploy and manage for VOIP and hotspots.
- SSL Secured captive portal and Web Admin
- Built in support for MikroTik Hotspot gateway
- User self care for sign up, activation and refill of prepaid account
- Payment gateway and prepaid voucher support
- Payments and vouchers' management including:
  - Vouchers' generation
  - Group policies
  - Reporting

# Spotngo Payment Module – Cont'

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- Supports location based branding, price groups and advertisements
- Currency prefix and postfix
- Plan / Tariff management:  
Including:
  - Auto Expiry – Time and date expiration
  - Time bank – Net usage
  - Data bank – Traffic
  - Bandwidth
  - Combination of the above.

# Payment Gateway support

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- Supported merchant accounts include:
  - PayPal
  - Authorize.net
  - Payflow
  - Verisign
  - PSIGate
  - Quickpay
  - Tranzilla
  - Payment Planet
  - Others
- Support for SMS integration for client identity verification and password delivery

# Spotngo Captive Portals Sample


The screenshot shows a browser window titled "Powered by SpotNGo - Windows Internet Explorer". The address bar contains "https://localhost/Payment?AP=MT&portal=mum". The page features a red header with the "mum" logo and "USA, Orlando". A navigation menu includes "Home", "Credit Card Sign Up", "Credit Card Refill", "Buy PIN Card", "PIN Card Registration", "Refill Account", and "Manage Account". The main content area contains a welcome message: "Welcome to MUM USA 2007!". It instructs users to login before browsing and provides a roaming account login instruction: "Roaming users welcome! To use a roaming account you need to login as user@network.com". Below this, it lists free locations: "www.mikrotik.com", "www.airadial.com", and "www.spotngo.com". A login section prompts users to enter their "User ID" and "Password" with a "Login" button. At the bottom, it states "When prompted use your Internet User-ID and Password." and includes logos for American Express, VISA, and MasterCard. The footer contains "© Copyright 2006 Spotngo Wireless Ltd." and "Internet" status.

The screenshot shows a "Spotngo Hotspot" interface with the URL "www.spotngo.ca". The header includes the "Spotngo Hotspot" logo and the tagline "Wireless Internet Access on the Spot". A navigation menu lists "Home", "Credit Card Sign Up", "Credit Card Refill", "Buy PIN Card", "PIN Card Registration", "Refill Account", and "Manage Account". The main content area features a blue background with a welcome message: "Welcome to Internet access portal". It instructs users to login before browsing and provides a roaming account login instruction: "Roaming users welcome! To use a roaming account you need to login as user@network.com". Below this, it lists free sites: "http://www.freeurl1.com", "http://www.freeurl2.com", and "http://www.freeurl3.com". A login section prompts users to enter their "User ID" and "Password" with a "Login" button. At the bottom, it includes logos for American Express, VISA, and MasterCard, and the footer contains "© Copyright 2006 HyHotspot Corp.".


# Sample Portals – Cont'

## As deployed by Sealink in Denmark

Home Buy Internet surf time Refill User; PIN Card Registration Refill by PIN Card Support Manage Account



**Wireless Hotspot**



**HOTEL**

Welcome to our Internet Hotspot


The Hotel offers wireless Internet access on the spot. You can check your mail, surf the web, connect to your workplace, instantly text, voice and video message your friends, family, and co-workers, and much much more..

Login to the Internet using your User Id and Password


User ID:

Password:


Login



We accept following credit cards:



© Copyright 2006 SEALINK wireless Connection.



Forside Køb Internet Surf-tid Tank op Surf-tid Indtast Surf-tid Indsæt på Konto Log in Min Konto

**Menu** WE CONNECT YOU TO THE WORLD... **Surf'n'go**

**Generelt :**

- > Nyheder
- > Priser
- > Locationer
- > Profil
- > Data
- > Hjælp/FAQ
- > Sikkerhed
- > Betingelser
- > Referencer

**IT Support :**

- > SEALINK

**Velkommen til Hotspot Sealink**

Indtast Brugernavn og Adgangskode for adgang til internettet.

Hotspot Sealink tilbyder Nordens hurtigste adsl linier. Log på internettet og surf med vores 4 og 8 mbit forbindelser.

Du kan bruge følgende websider uden log in:


[www.google.dk](http://www.google.dk) [hotspot.sealink.dk](http://hotspot.sealink.dk) [Sealink Support](#)

Log på internettet med dit brugernavn og adgangskode

Brugernavn:

Adgangskode:

Login




**NY BRUGER:**  
Klik på linket [Køb Internet Surf-tid](#)

Vælg ønsket Internettid

Udfyld felterne Brugernavn og Adgangskode, navn og email

[Start](#) | [Stop](#)

Driftstatus  
HOTSPOT  
SEALINK



Onsdag  
30. maj 2007

[DK](#) [UK](#)

*Gå på internettet med Hotspot Sealink*

# Spotngo – User Self Signup



Spotngo Hotspot  
www.spotngo.ca Wireless Internet Access on the Spot

Home Credit Card Sign Up Credit Card Refill Buy PIN Card PIN Card Registration Refill Account Manage Account

Plan to Purchase	Price	
1 Hour of Use	\$ 2.50	<input type="button" value="Buy"/>
3 Hours of Use Starting Now	\$ 3.00	<input type="button" value="Buy"/>
6 Hours of Use Starting Now	\$ 6.00	<input type="button" value="Buy"/>



© Copyright 2006 MyHotspot Corp.



# Spotngo User Signup - Cont'



Spotngo Hotspot  
www.spotngo.ca Wireless Internet Access on the Spot

Home Credit Card Sign Up Credit Card Refill Buy PIN Card PIN Card Registration Refill Account Manage Account

**User Name** tomer Available!

**Password** Password: •• Confirm Password: ••

**Name** First: tt Last: tt

Company: tt

**E-Mail** tshahaf@spotngo.ca

Phone Primary (Mobile): 416-410-3518 Secondary (Home/Company):

Address Street:

City: Postal Code (Zip):

State: (Outside US & Canada) ▾

Country: (Select Country) ▾

**Next >>**

1 2 3 done!



© Copyright 2006 MyHotspot Corp.

# Spotngo User Signup - Cont'



Spotngo Hotspot  
www.spotngo.ca Wireless Internet Access on the Spot

Home Credit Card Sign Up Credit Card Refill Buy PIN Card PIN Card Registration Refill Account Manage Account

Name **tt tt**

E-Mail **tshahaf@spotngo.ca**

User Name **tomerr**

Plan Name **6hr**

Plan Description **6 Hours of Use Starting Now**

Price **\$ 6.00**

Card Type **Visa**

Credit Card #

Expiration **January** / **2009**

CCID  (3 digits on back of card)


I hereby confirm I have read and agreed to [terms & conditions.](#)

1 2 3 done!



© Copyright 2006 MyHotspot Corp.

# Spotngo Web Admin Interface



Spotngo Hotspot  
www.spotngo.ca Wireless Internet Access on the Spot

Reload Changes

Plans

PIN Cards

Payments Lookup

Advanced Configuration

Plans List

Plan Name	Description	Price	Enforcement Type	Price Group	Aradial Group	Action
<a href="#">1hr</a>	1 Hour of Use	\$ 2.50	Meetering		Wifi	<a href="#">Delete</a>
<a href="#">1hrTot</a>	1 Hour of Total Use	\$ 2.10	AutoExpire	Plangroup1	Wifi	<a href="#">Delete</a>
<a href="#">3hr</a>	3 Hours of Use Starting Now	\$ 3.00	AutoExpire		Wifi	<a href="#">Delete</a>
<a href="#">6hr</a>	6 Hours of Use Starting Now	\$ 6.00	AutoExpire		Wifi	<a href="#">Delete</a>
<a href="#">Daily_1</a>	24 hours of internet access	\$ 7.95	AutoExpire	hotel	Wifi	<a href="#">Delete</a>
<a href="#">hour1</a>	1 Hour of Internet Access within 24 hour period	\$ 4.95	AutoExpire	hotel	Wifi	<a href="#">Delete</a>

# Spotngo - Adding Service Plan

The screenshot displays the Spotngo Hotspot management interface. At the top left is the logo and website information: "Spotngo Hotspot" with the URL "www.spotngo.ca" and the tagline "Wireless Internet Access on the Spot". A "Reload Changes" button is located in the top right corner. On the left side, there are four menu items: "Plans" (with "Add" and "Edit" buttons), "PIN Cards" (with "Add" and "View" buttons), "Payments Lookup", and "Advanced Configuration". The main content area is titled "Add/Edit Plan" and contains a form with the following fields:

Plan Name	Daily
Plan Description	1 day of continuous access
Price ()	4.95
Enforcement Type	AutoExpire
Price Group Identifier	
Time Bank (Minutes)	0.0
	<input type="checkbox"/> Enforce Time Bank
MB Bank	0.000
	<input type="checkbox"/> Enforce MB Bank
Expiration Time (Minutes)	1440.0

At the bottom of the form are three buttons: "Update", "Add", and "Reset".

# Spotngo - Payment Report



Spotngo Hotspot  
www.spotngo.ca Wireless Internet Access on the Spot

Reload Changes

Plans

PIN Cards

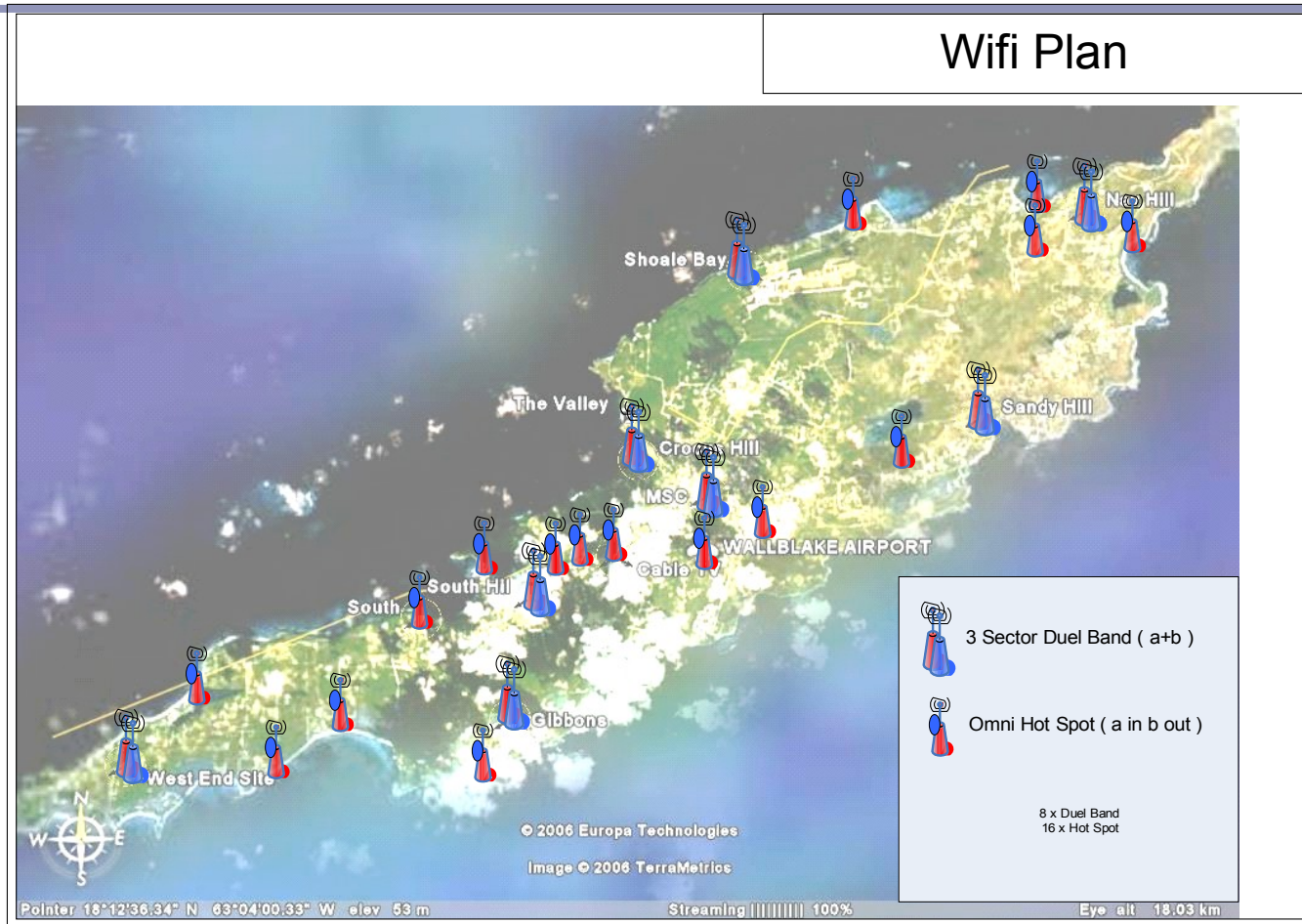
Payments Lookup

Advanced Configuration

Payment Report

Date	Item Name	Price	Status	Hotspot Id	First Name	Last Name	Transaction Id	Action
04/18/06 11:32:41	3hr	3.00	Paid	example	tom	shahaf	0	<a href="#">Details</a>
04/29/06 10:54:07	1hr	2.50	Paid		brian	sherban	0	<a href="#">Details</a>

# Sample Deployment with Mikrotik Router OS - WebLinks



# Sample Deployment in Nigeria

