



**Funk Software's Industry-leading Steel-belted RADIUS Solutions
Provide a Complete Network Management Environment
For CommWorks Total Control Architecture**

Overview

Within any sophisticated networked communications environment, there exists a balancing act between providing user access and protecting network resources from unauthorized access, compromise and/or destruction. Therefore, effectively integrating the management of security and administrative functions represents a critical requirement for assuring overall network integrity, controlling remote user access and supporting the cost-effective delivery of value-added network services.

RADIUS (Remote Authentication Dial In User Service) is the universally accepted standard for addressing these issues throughout virtually all IP-based datacom and converged services networks, including both wired and wireless environments. Supported by all leading vendors of networking systems and remote gateway products, RADIUS provides a standardized method for all gateways to communicate with central servers and to manage AAA services, consisting of:

- Authentication – Accurately determining each user's correct identity.
- Authorization – Determining which services the user is permitted to access.
- Accounting – Tracking which services are used, by whom and for how long.

In keeping with our overall commitment to provide customers with robust networking solutions that are optimized for value, performance and scalability, CommWorks has partnered with Funk Software to deliver Funk's industry-leading Steel-Belted RADIUS solutions in conjunction with the CommWorks Total Control™ architecture.

Funk Software: Leadership in Network Management Solutions

Based in Cambridge, Massachusetts, Funk Software is the developer of the award-winning Steel-Belted Radius family of RADIUS authentication solutions. In use on thousands of enterprise and service provider networks worldwide, Steel-Belted Radius™ delivers a RADIUS solution with the reliability and scalability required by the largest wireless operators, carriers, and service providers, as well as meeting the centralized authentication needs for enterprise networks.

When a user dials in to a remote access device, that device communicates with the central RADIUS server to determine if the user is authorized to connect to the network. If the user is accepted, the remote access server routes the user onto the network; if not, the

RAS terminates the user's connection. The RADIUS server also can provide full accounting services, so the network manager or ISP only needs to maintain a single, central database for authentication of all remote users. This greatly eases the management burden associated with administering large numbers of dial-in users.

Although RADIUS is a universally accepted standard, RADIUS servers are not all equal. Beyond providing the baseline AAA functionality outlined above, Funk Software's Steel-Belted Radius AAA solutions support the widest variety of network access equipment and back-end business systems for instant compatibility in any network environment. Plus, Steel-Belted Radius' market-leading reliability and highly scalable transaction capacity make it suitable for even the most demanding carrier-class environments.

Leveraging Funk Software within the CommWorks 3-tiered Architecture

The CommWorks multi-service 3-tiered architecture provides a comprehensive robust infrastructure of gateways, gatekeepers and back-end servers that enable carriers and service providers to cost-effectively develop, deploy and manage a full spectrum of networked services. Tier 1 provides universal connectivity for media processing, Tier 2 delivers seamless signaling and control protocols across disparate network environments, and Tier 3 offers a highly efficient open environment for service creation. Interwoven as a key element throughout the CommWorks Total Control architecture, Funk Software's Steel-Belted RADIUS solutions provide secure, adaptable and highly manageable network access mechanisms.

Large-scale Multi-service Carrier and ISP Environments:

Steel-Belted RADIUS/Service Provider Edition (SBR/SPE) incorporates all of the advanced functionality, reliability, and robust performance required to manage essential AAA functions within complex multi-service environments for carriers and service providers who are managing hundreds of thousands of customers with a variety of data, voice and other services.

- Carrier-grade reliability and capacity – The Telecommunications Act of 1996 mandates 99.999% network uptime for carriers. SBR/SPE provides state-of-the-art reliability, load balancing, redundancy, and scalability for unparalleled transaction capacity, enabling carriers to meet stringent “five 9’s” uptime requirements.
- User authentication of user names in any format against any combination of back-end databases, including SQL and LDAP compatibility.
- Usage-based billing via RADIUS accounting, with built-in flexibility regarding how and where accounting data is logged, as well as compatibility with existing back-end billing systems already in use at the carrier.
- Multi-service delivery, including wireless, VPN, broadband, and dial-up, for consistently ensuring the appropriate level of service to the appropriate customers.
- Specialized operations features including user name transformation and service-type mapping to meet unique carrier-specific requirements.
- Concurrent login enforcement to eliminate account abuse by barring multiple logins from the same user.

3G Wireless Infrastructures:

As a key part of our integrated, policy-based IP wireless mobility solution, CommWorks uses Funk Software's Steel-Belted Radius/Advanced Wireless Edition (SBR/AWE) because it offers our wireless customers significant advantages in functionality and integration. In particular, SBR/AWE contributes to the following key requirements for building a 3G wireless infrastructure:

- Mobile IP support – SBR/AWE supports standards-based Mobile IP authentication, authorization, and accounting requirements as outlined in the ITU TR 45.6, and IETF draft-ietf-mobileip-aaa-reqs-04.txt, which specify how a Mobile IP connection is to be managed and maintained.
- Performance – The sheer volume of wireless subscribers puts an enormous burden on a RADIUS/AAA server: On a 3G network, a RADIUS/AAA server must process a request whenever a subscriber requests access or moves between coverage zones. SBR/AWE is capable of handling thousands of RADIUS requests per second on CommWorks Total Control platforms.
- Multi-faceted service delivery – SBR/AWE automatically configures Mobile IP connections, issues the subscriber an IP address and seamlessly maintains it during all movements around the wireless network. User connections can be based on various characteristics, such as time-of-day restrictions, allowed bandwidth, and session timeouts. SBR/AWE also efficiently pushes connection information out to network devices such as WAP gateways, enabling them to deliver personalized content and real-time information such as stock quotes to subscribers.
- Consumptive billing – SBR/AWE tracks and documents all access to the network via RADIUS accounting. All information – including remote user name, duration of connection, device to which the user connected, and amount of data transmitted – can be written directly to a SQL back-end, enabling wireless providers to create call data records to charge customers on virtually any basis.
- Multi-vendor support – As with all other editions of Steel-Belted Radius, Steel-Belted Radius/AWE supports the widest variety of access hardware, thereby enabling CommWorks Total Control infrastructures to seamlessly inter-operate virtually any other vendors supplying or developing 3G solutions.

The Bottom Line

In summary, the powerful combination of CommWorks comprehensive Total Control network architecture and Funk's Steel-Belted Radius AAA management software empowers carriers and service providers with an unparalleled foundation for building, maintaining and scaling new generation multi-service networks. The bottom line is that the CommWorks architecture with Funk Software's Steel-Belted Radius arms service providers with the means to efficiently manage the growth of their subscriber base and revenue stream while smoothly incorporating value-added service offerings to meet market requirements.