

DOES YOUR NETWORK ACCESS CONTROL HAVE WHAT IT TAKES?

➤ Key Authentication, Authorization, and Accounting (AAA) Capabilities Required to Support Wireless Data Growth in Service Provider Networks

INTRODUCTION

With the commoditization of voice services, Service Providers have invested significantly in their networks to deliver enhanced data services in an effort to drive up average revenue per user (ARPU). Not only are they providing a growing revenue stream but data services also offer service differentiation in a crowded and intensely competitive market. However, as much as they present compelling ways to attract and retain new customers and ultimately minimize subscriber churn, wireless data services in conjunction with enabling technologies present numerous challenges for Service Providers.

To accommodate the explosive growth of data services and meet the complex demands of subscribers, as well as “future proof” their business capabilities, wireless Service Providers are taking advantage of advances in network technologies and leveraging multi-network environments — including fixed-mobile convergence applications and 4G entries such as WiMAX. But more networks, more advanced multi-mode devices, and the introduction of more applications result in a fragmented network experience for subscribers. The reality of accessing different applications and services across multiple networks — using different logon procedures, for example — is contrary to the seamless experience that subscribers are demanding. The outcome for Service Providers includes increased customer care and acquisition costs, and more — not less — subscriber churn.

In view of such challenges, authentication, authorization, and accounting (AAA) functions are asserting themselves as business-critical network access control elements within Service Provider networks. A scalable, high-performance AAA platform — featuring a centralized subscriber management database and policy control servicing all network technologies — is a key stepping stone to improving the overall subscriber experience (with reduced subscriber churn as a result) and operational efficiencies. Ultimately, the AAA server also serves important business objectives such as the harnessing of additional revenues from premium network and application services.

OVER THE PAST FEW YEARS, WHILE IMPLEMENTING WIRELESS DATA SERVICES MANY SERVICE PROVIDERS CHOSE AN AAA SOLUTION THAT IS NOW PROVING INADEQUATE GIVEN THE DEMANDS OF A CONVERGED NETWORK AND THE NEED TO INTEGRATE WITH OTHER PLATFORMS.

But there’s a catch. While implementing wireless data services over the past several years, many Service Providers opted for a range of AAA alternatives — including:

- > Economical or homegrown AAA systems that no longer provide the performance, scalability, or functionality required to support new service initiatives.
- > Existing HLR device authentication with a common user name defined across all devices and local user authentication handled by a GGSN directly.
- > AAA solutions heavily tied to a network equipment vendor, which may lack depth in functionality or the ability to integrate easily with new network and application infrastructures as well as perpetuate the hidden costs of vendor lock-in.

These and other approaches are proving inadequate in light of the increased load in a converged network or the growing need for integration with other platforms. There is a key imperative to establish a flexible underlying access control infrastructure that provides the carrier-grade performance and reliability required by global operators.

To avoid the very real threat of network outages and to take full advantage of new data services opportunities via a seamless customer experience, many wireless Service Providers need to replace their AAA system with one that offers performance and scalability, the ability to handle multiple networks simultaneously, and easy integration with various other systems as new services are brought online. Ideally, the system should also be vendor and network neutral.

This paper discusses the functionality that AAA systems must provide to support data services growth, why AAA replacement may be necessary, what’s involved in the process, and the benefits. It concludes with an overview of the Bridgewater Systems carrier-grade AAA Service Controller and the critical support that Bridgewater Systems can bring to Service Providers as they launch IP services over multiple networks.

WIRELESS DATA SERVICES ARE KEY TO SUCCESS

- > U.S. WIRELESS CARRIERS ARE FINALLY BEGINNING TO SEE THEIR DATA ARPU REACH SIGNIFICANT LEVELS, AS TEXT MESSAGING, RING TONES, AND WALLPAPER OR GAME DOWNLOADS ARE HELPING TO MAKE UP FOR VOICE ARPU EROSION. FOR EXAMPLE, IN THE FINAL QUARTER OF 2006, CINGULAR HAD MORE THAN 32 MILLION ACTIVE DATA CUSTOMERS AND DELIVERED NEARLY 180 MILLION MULTIMEDIA MESSAGES AND MORE THAN 12 BILLION TEXT MESSAGES, WITH A YEAR-OVER-YEAR INCREASE OF 53% IN DATA ARPU.¹
- > CONSUMER MOBILE DATA APPLICATIONS — SUCH AS MESSAGING, GAMES, AND MUSIC — WILL BE WORTH \$6.2 BILLION IN WESTERN EUROPE BY 2008.² IDC INDICATES THAT THE MARKET WILL EXPAND FROM EARLY ADOPTERS AND THE YOUTH SECTOR TO INCLUDE THE WIDER CONSUMER MASS MARKET AS WELL AS BUSINESS USERS. IT ALSO IDENTIFIES THIRD-PARTY REVENUE SHARING AS A SIGNIFICANT GROWTH AREA AS NETWORK OPERATORS, CONTENT PROVIDERS, AND SERVICE PROVIDERS LOOK TO PARTNER TO PROVIDE CONTENT TO MEET MARKET DEMAND.
- > CONTENT SERVICES, INCLUDING MUSIC AND VIDEO DOWNLOADS, GAMING, AND INFORMATION SUBSCRIPTION SERVICES, ARE WITNESSING RAPID, EVEN EXPLOSIVE, GROWTH. ACCORDING TO GARTNER, BY 2010 CONSUMER SPENDING ON MOBILE MUSIC WILL SURPASS US\$32 BILLION.³
- > IDC EXPECTS OPERATOR MOBILE DATA SERVICE REVENUE TO GROW FROM US\$79 BILLION IN 2005 TO MORE THAN US\$137 BILLION OVER THE NEXT TWO YEARS.⁴

NEW SERVICES ARE LOADING THE NETWORK

Aggressive marketing of data services is yielding increasing numbers of subscribers and transactions. These growth factors are significantly loading networks to the point where network outages — due to the lack of scalability and performance of AAA systems — are a very real possibility.

New services such as dual-mode devices that hand off between wide and local networks are also adding strain to AAA services. This extended network infrastructure allows a Service Provider to use Voice over Internet Protocol (VoIP) to lower the cost of calls and offer ubiquitous data access as networks extend into non-traditional environments (homes, small to mid-sized businesses, etc.). While this provides subscribers with increased opportunities to use available data services, it also means that advanced business rules and policy will be required to prevent non-authorized access by devices and subscribers.

As subscribers access other services such as those offered by DSL providers for Internet Protocol Television (IPTV), subscribers and devices are being authenticated by AAA servers to ensure that they have the appropriate access entitlement rights to the network and that the devices are genuine.

Network convergence, including fixed-mobile convergence — currently a crucial strategic issue in the industry — will push AAA servers to their limits as Service Providers strive to provide a consistent subscriber experience across multiple access technologies.

The need for a common authentication scheme across Wi-Fi, WiMAX, CDMA/UMTS, and DSL requires an AAA server that can handle multiple networks, protocols (RADIUS, Diameter), and authentication schemes (EAP) simultaneously. In addition, AAA servers must be able to inform a business support system (BSS) which network a subscriber is using — plus when, and for how long — to enable roaming reconciliation. Finally, the servers must be capable of providing critical real-time information about the subscriber — including location information — to enable delivery of services based on entitlement rules that the Service Provider controls.

ROBUST AAA FUNCTIONALITY IS CRITICAL

To support the growth that comes with data services, Service Providers must ensure that their AAA system is sufficiently robust to grow with their business, scaling up to support growing subscriber bases and transactions and integrating new networks and services as they are deployed.

While many Service Providers have AAA systems today, these are designed to suit the needs of limited-scale deployments such as those found in an enterprise, rather than a carrier-grade environment. The reality now is that many of these systems just cannot be viably upgraded to support the kind of functionality that Service Providers need today and into the future.

At the same time, Service Providers need to be sure that their AAA vendor can support their growth needs, with a product roadmap that integrates new functionality, including standards-based functions and participation, proven interoperability, and off-the-shelf functionality that accelerates time to market.

¹ AT&T, January 24, 2007, Newsroom.

² IDC 2005.

³ Gartner Dataquest 2006.

⁴ IDC 2004.

BUSINESS VALUE OF AAA REPLACEMENT

The failure of an overloaded AAA system means subscribers can't access the network. That translates into revenue loss, increased customer support costs, and subscriber churn. Here are some examples that demonstrate how business growth and sustainability are closely tied to the capabilities of an AAA solution.

- > **Scalability supports subscriber and transaction growth and avoids costly network outages that impact subscriber retention.** Lightweight AAA systems can be scaled to some degree but doing so usually involves investing in more hardware, with each machine running a few CPUs. This leads to a continuing cycle of adding hardware — with associated planning, installation, management, and housing costs — which further strains operating and capital expenditures.
- > **Performance supports significant increases in transactions and a positive subscriber experience.** With the success being reported in subscriber growth and data services usage, the pivotal role of an AAA server must be acknowledged. AAA performance will continue to be a mission-critical requirement to support business growth and a seamless subscriber experience over multiple networks and device types.
- > **Extensibility supports business growth and services differentiation.** This includes adding new network elements, such as universal access gateways in 4G network deployments, and integrating with other systems as part of new services deployment.
- > **Multiprotocol support allows multiple networks and facilitates migration to IMS.** Early implementations of next-generation 4G networks including WiMAX will be implemented using RADIUS, as specified within current standards, with a migration to Diameter in the near future. Service Providers can protect their investment in legacy applications and services and leverage new SIP-based services as they migrate to next-generation networks and IMS/MMD frameworks.

- > **Simultaneous support of multiple network types, including converged networks, allows business expansion and the ability to leverage new network technologies and services.**

As Service Providers extend their business with WiMAX, EV-DO, and HSDPA, they require a common AAA infrastructure, including a subscriber management system that serves all networks to avoid the costs of re-provisioning subscribers in multiple network-centric databases.

- > **Vendor experience and support.** The AAA vendor must have a comprehensive support infrastructure in place to ensure that the AAA system maintains its functionality and ability to handle increasing loads as well as extensive integration and interoperability experience. Poor support and slow problem resolution will increase costs, if the Service Provider needs to develop specially trained personnel. Further consequences include lost revenues, if service outages occur, and slower deployments for new services, which will impact the operator's competitive advantage.

KEY FUNCTIONALITY OF A CARRIER-GRADE AAA SYSTEM

Beyond pure scalability and performance requirements, a carrier-grade AAA system must provide a full slate of functionality to give Service Providers the ability to appropriately track and monetize network access in real time. Features should include:

- > **Integrated policy engine and database** that supports flexible network, service, and user policies defined at many levels of granularity — including domains, user groups, individual users, wholesale and retail subscriber bases — and new business models.
- > **Centralized, network-wide subscriber management system** that gives Service Providers the ability to centrally manage all subscribers, create comprehensive profiles that define access entitlements across all available services and networks, and avoid re-provisioning subscribers into multiple databases as new network types are integrated.
- > **Vendor and network agnosticism** — an increasingly important requirement in converged network environments — to allow easy integration in mixed vendor environments, avoid the hidden cost of vendor lock-in, and provide a future-proof solution.
- > **Real-time session management** to accommodate new applications that require subscriber context in the form of dynamic information about the subscriber to enrich the subscriber experience (e.g., determining if the subscriber is on the network, what he or she is trying to access, if the subscriber is roaming, his or her device type). This includes the ability to enable flexible formatting of session data such as RADIUS accounting records, which can be pushed to a wide range of application servers.
- > **Simultaneous support for key industry standards** — Packet Data Serving Node (PDSN), Gateway GPRS Support Node (GGSN), Home Agent (HA), 2nd Generation Inter-working Function (2GIWF) vendor equipment, Wi-Fi, WiMAX, and DSL — with extensibility to accommodate new equipment and standards. This functionality allows Service Providers to converge their services across an integrated infrastructure, improves the subscriber experience, reduces customer care costs, and accelerates the uptake of new services.
- > **Ability to record, correlate, and replicate detailed accounting data** for billing, reporting, and network planning, with customizable, partitioned data streaming. This functionality is critical to ensuring that all usage is appropriately captured and billed — improves revenue capture and eliminates need for costly upgrades to existing billing systems or custom mediation solutions.
- > **More than simple RADIUS authentication and authorization**, the AAA system should also be able to cover and provide subscriber and device authentication, authorization, and accounting for access to a wide range of data services, including:
 - *Presence servers* that offer the ability to see and display a subscriber's online status, which is commonly used for field force dispatch scenarios.

- *Prepaid data services*, offering the ability to integrate with billing systems and meter a subscriber's session based on a quota supplied by a Prepaid System, as well as provide comprehensive accounting information for postpaid data services.
 - *Hotlining* that provides the ability to divert subscribers from their desired destination to one controlled by the Service Provider. This is particularly useful when requiring prepayment for services or delinquent postpaid accounts or even for advertising during account updates or other administrative activities.
- > **Simultaneous support of RADIUS- and Diameter-based authentication protocols.** This allows the Service Provider to implement common policies across access networks and enable a consistent network experience for the subscriber, regardless of authentication method. For example, subscribers can use a common user name and password across all access networks, subscriber data can be managed within a single profile repository, and common time attributes can be applied for session and idle timeouts. This represents an important requirement as Service Providers migrate to IMS and need to be able to support both SIP- and non-SIP-based applications simultaneously as part of the migration process.
- > **Support for Extensible Authentication Protocol (EAP)**, which is important for the creation of security policies specific to the application being deployed but also broadens scope of available service opportunities. Examples of network types that use EAP methods include Wi-Fi, WiMAX, and fixed-mobile convergence applications such as GAN/UMA and WLAN internetworking.
- > **Data roaming support**, which is becoming increasingly important for wireless network operators given the significant uptake in sticky data services that is driving ARPU to unprecedented levels. Data roaming allows subscribers from one network to use their devices to access their "home" data services on another network. For example, an important AAA server capability is Mobile IP support within CDMA 1X, EV-DO/A, and WiMAX networks, which enables a

roaming subscriber's data session to be anchored in the subscriber's home network and provides access to all of the services available on his or her home network while roaming. All IP packets are tunneled back to the home network so that the subscriber can leverage all existing services while roaming in a different network and the Service Provider can leverage all data services revenues, both while the subscriber is in the home network and while the subscriber is roaming.

BUSINESS BENEFITS OF AAA REPLACEMENT

COST EFFICIENCIES

Network outages can be extremely costly in the short and long term. Any network outage will have significant costs involved in getting the network up and running again, as well as costs associated with increased call center traffic to handle customer queries. In addition, with subscriber number mobility, one network outage might be all it takes to persuade subscribers to move elsewhere. With a system in place that can handle growth, network outages and their associated costs can be avoided.

A system that offers **carrier-grade performance and scalability** helps avoid increased operational costs. For instance, enterprise-grade systems may require upgrading CPU power in the form of extra machines due to lack of vertical scalability to handle increased numbers of transactions. These upgrades can take up to three months to plan and put into place, which for some Service Providers equates to an expectation of multiple concurrent upgrades going on indefinitely. Each upgrade requires significant manpower for planning and implementation because space, electrical consumption, air conditioning, network routing tables, management systems, and other elements must all be evaluated and increased if necessary. It makes more sense to implement a system that can easily scale to handle increased numbers of subscribers and transactions without the ongoing upgrade projects.

INCREASED REVENUE OPPORTUNITIES AND ARPU

New wireless data services are where the money is, with increasing data ARPU now being reported by many operators, driven by uptake in:

- > Messaging, such as Multimedia Messaging Services (MMS).
- > Internet browsing.
- > Personalization downloads, such as ring tones and screensavers.
- > File downloads, such as pictures.
- > Content and entertainment applications, such as streaming video.
- > New media-rich applications enabled by high-bandwidth, 4G networks.

New services encourage usage and raise transaction rates even higher, resulting in new revenue streams while creating a sticky and compelling subscriber experience. An AAA solution needs to have the scalability, performance, and extensibility pedigree to be able to support these new services today, and into the future.

IMPROVED SUBSCRIBER EXPERIENCE

Meeting the complex demands of subscribers — who want what they want, when they want it, and how they want it, with minimal effort — is key to subscriber retention. AAA network access control servicing all network technologies can deliver a better overall user experience — and, with it, reduced subscriber churn. Equally important is the need for a common subscriber policy and profile repository that enables a single subscriber-centric view across all networks and services.

REDUCED CUSTOMER CARE COSTS

Whether prepaid or postpaid, new service introduction requires an AAA system that can quickly and easily integrate new services with subscriber profile stores, provisioning, and billing systems.

This includes the ability to capture real-time usage data to ensure accurate billing, which also cuts down on customer care calls from unhappy customers and reduces revenue leakage.

A high-performance AAA solution will get your customers on the network quickly and efficiently, reducing the potential for trouble tickets that need to be investigated and resolved.

Delegated administration — extending authentication administration downstream from Service Providers to corporate customers (and even further to individual users via their departments) — is also proven to reduce customer care costs. With service profiles at their command, corporate administrators can assign access — types of services, with time or date restrictions, etc. — and control who is granted that access. Actual definition, promotion, and implementation of service profiles remain with the Service Provider, so both parties increase efficiencies and gain control where they need it most.

WHAT'S INVOLVED IN AAA REPLACEMENT?

While replacing an AAA system may seem like a major undertaking, with the right solution and proper planning it can prove to be a cost-effective and efficient process. One of the single most important elements in an AAA replacement project is vendor support. Because an AAA replacement exercise can take time and involves work to be done in the network, it's important to ensure that the AAA vendor has the right solution and is committed to properly supporting the project from start to finish.

As important, though, is the ability to reuse as much existing infrastructure and equipment with as little change as possible to reduce the time and cost of the project and to extend the ROI of these components. This means that the AAA solution must integrate into the existing environment and, in fact, require replacement of as little as possible — ideally, only the AAA servers.

Key steps of an AAA replacement project include:

Project plan: A comprehensive project plan must be developed with the vendor, identifying objectives, timeline with activities and milestones, and resource requirements. This plan should identify a full migration plan

and spell out success criteria. The vendor should have internal resources with the expertise and skills to help create and then implement a realistic and achievable project plan.

Project deployment: The vendor should have a full deployment team available for the project, including senior-level project managers as well as technical resources skilled in carrier-grade deployments and integrations.

Infrastructure and equipment reuse: To save time and money, existing infrastructure and equipment should be reused. At a minimum, this should include:

- > Lightweight Directory Access Protocol (LDAP) directories, which contain subscriber profile information used in the authentication and authorization process.
- > Provisioning Application Program Interface (API) and Graphical User Interface (GUI) elements that have been custom-developed for the Service Provider's specific environment.
- > Incorporating the existing flat-file output model(s), rather than creating new ones.

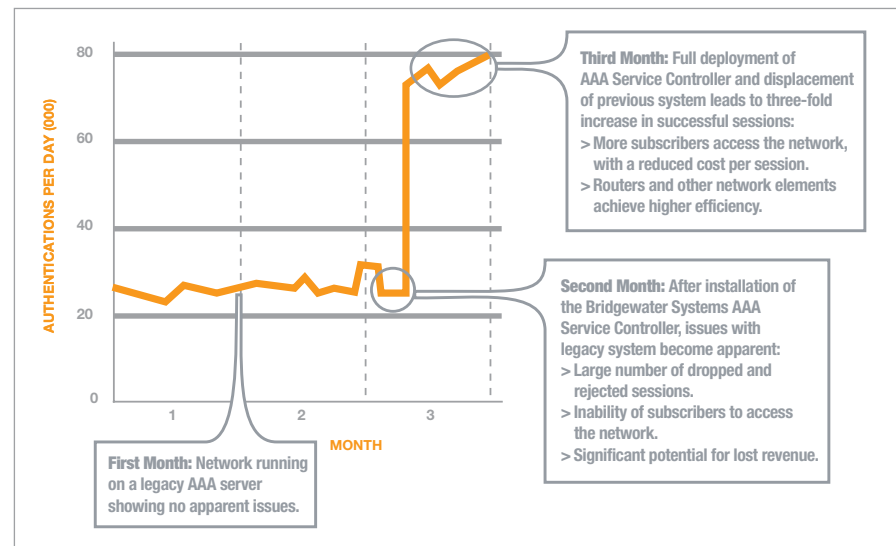
Staged implementation: The implementation should be staged in a manner that provides no disruption to subscribers and can be done by geographical breakdown, service, or subscriber type.

CONCLUSION

To effectively capitalize on the wireless data services market, Service Providers must be able to deploy new services profitably and handle the resulting increase in subscriber traffic and transactions. Now is the time for Service Providers to replace AAA systems in favor of a full-functioned carrier-grade system that can scale to integrate new services, handle the subscriber/transaction growth they need to meet their revenue targets, and avoid excessive costs to maintain older legacy systems or those tied to network equipment types and vendors.

BRIDGEWATER SYSTEMS AAA SERVICE CONTROLLER

AAA Service Controller is a proven carrier-grade solution deployed in more than 80 Service Provider networks around the globe. Fully redundant and scalable, the solution addresses today's complex, distributed networks and their customer bases. It provides the functionality and performance needed for today's Service Providers who want to capitalize quickly on wireless data services while being confident that their AAA system can scale to accommodate growth in subscribers, transactions, new services, and network types, including fixed-mobile convergence scenarios.



Immediate results: installation case study.

AAA Service Controller is part of the Bridgewater Systems portfolio of subscriber-centric policy management solutions for mobile, fixed, and converged operators. Featuring network access control, subscriber management, and application and network policy control products, this broad portfolio is based on proven high-performance technology, enabling operators to control and monetize subscriber access at multiple levels, including applications, networks, and real-time resources.

HIGHLIGHTS

- > **Proven performance capabilities** — with live deployments ranging from 5,000 to more than 64 million provisioned users and transaction volumes of more than 14 billion per month.
- > **Vendor and network neutral** — a best-in-class solution, supporting a wide range of network vendor equipment and access types and infrastructures, including CDMA, GPRS, UMTS, Wi-Fi, WiMAX, DSL, and Cable.
- > **Proven integration and interoperability** — with a broad range of network elements, application platforms, and OSS/BSS.
- > **Open distributed architecture** — allowing Service Providers to define subscriber policies and profiles centrally while extending local control to business or retail ISP customers.
- > **Out-of-the-box solution** — AAA Service Controller is deployable in weeks, not months, improving time to market.
- > **Adherence to standards** — based on the IETF RADIUS industry standard and also supports the TIA 3GPP2 and TIA/IS-835-C standards, the WiMAX Forum, and 3GPP TS29.061.

Bridgewater Systems has a proven track record of ongoing development to its AAA solution. Service Providers can be confident that their Bridgewater Systems AAA solution will continue to be developed and enhanced as technologies, standards, and opportunities evolve.

VALUE-ADDED FUNCTIONS

- > **Prepaid and Postpaid Charging** — Track and capture subscriber usage data and streamline accounting records to back-end billing systems. The approach is to change and/or augment the AAA system, which is faster, simpler, and more cost-effective than changing the billing engine and allows Service Providers to take advantage of both postpaid and prepaid data service revenues today, while conforming to standards as they are deployed.
 - Filter, format, and stream records to external billing systems, as an affordable alternative to custom mediation solutions — and reduce volume of records streamed to billing systems by up to 80%.
 - Prevent revenue leakage by determining ability to pay before the subscriber gains access to services.
 - Conduct prepaid mediation by authorizing transactions and confirming them in real time. Leverage existing components and work with many prepaid systems, including new data-billing systems and existing voice-billing systems.
- > **Session State Management** — Track active sessions across the network and maintain essential information about the subscriber in a real-time data store. This gives Service Providers the ability to look up the user or billable identity of a subscriber currently using an IP address, relieves the burden of identity management from applications, and enables tracking session starts and stops in real time.
- > **Dynamic Mobile IP Key Update (DMU)** — A secure and efficient mechanism for distributing and updating Mobile IP cryptographic keys in CDMA2000 1xRTT and 1xEV-DO networks. The DMU procedure occurs directly between the Mobile Node and AAA Service Controller. This increases the security of the network by allowing individual user keys and simplifies the updating of keys.
 - The Mobile Identification Number (MIN) is used to bill subscribers. MIN Check verifies that the MIN contained in the message coming from the PDSN is the same MIN provisioned for the

subscriber. MIN Check prevents fraudulent accounting records by ensuring that the correct MIN is placed in the accounting record.

- > **Extensive EAP support** — A requirement in mobile WiMAX and in fixed-mobile convergence deployments.

CUSTOM DEVELOPMENT

Bridgewater Systems also offers custom development of the AAA solution to modify the solution to meet unique Service Provider requirements and deliver specific functionality. Examples include:

- > **Binary Runtime Environment for Wireless (BREW) integration**, which allows developers to create portable applications that will work on any handsets equipped with CDMA chipsets.
- > **Customized administrative interfaces** provide flexibility in account management, whether for customer service personnel or for customer self-care.
- > **Plug-in applications** allow modification of the AAA cycle before or after any of the standard authentication, authorization, or accounting steps, providing additional functionality to integrate with external systems such as customer care systems or prepaid engines.
- > **APIs** allow modeling of any service or performing any provisioning in a manner that meets a Service Provider's unique needs.

EXPERT IMPLEMENTATION

The Bridgewater Systems solution is backed by the best expertise in the industry, based on our vast experience in developing and deploying carrier-grade solutions to more than 80 Service Providers around the globe. The Professional Services team comprises a wide range of skills and expertise in small- to large-scale RADIUS deployments and AAA solutions, including database development, accounting functionality development, and policy-based authorization, and leverages that expertise to quickly and cost-effectively create the optimum deployment.

When performing an AAA replacement project, Bridgewater Systems' goal is to replace as little as possible, with a focus on extending the return on investment in key elements such as LDAP directories and custom-developed elements such as provisioning APIs, GUIs, and file-output formats.

UNPARALLELED SUPPORT

The Bridgewater Systems Customer Support team is a group of highly knowledgeable, experienced support specialists who provide a comprehensive range of personal and interactive services and training to keep customers connected and operational.

Bridgewater Systems' customers receive:

- > 24/7 support services.
- > Rapid response to email support requests.
- > Remote dial-in analysis, problem management, and error corrections.
- > Proactive problem tracking.
- > Secure customer website providing access to documentation, ongoing feature enhancements, and support case database.
- > Product updates and downloads, with access to timely information.
- > Customized training.

ABOUT BRIDGEWATER SYSTEMS

Bridgewater Systems develops the industry's most advanced subscriber-centric policy management software for fixed, mobile, and converged networks. Its solutions help global Service Providers launch new services faster and maximize profits by creating a subscriber-centric policy decision point to control and monetize the dynamic subscriber interaction with IP-based services. Vendor-neutral and access-network agnostic, Bridgewater Systems' comprehensive policy management portfolio features network access control products, including authentication, authorization, and accounting (AAA) and dynamic host configuration protocol (DHCP) systems; entitlement control products to manage subscriber access to applications and network resources; and robust subscriber management via a centralized policy and profile repository solution. Bridgewater Systems' proven carrier-class products help Service Providers enrich the subscriber experience and enable extensive revenue capture capabilities and out-of-the-box value that can be deployed in weeks — instead of months.

More than 80 leading Service Providers around the globe, including Verizon Wireless, Sprint, Bell Mobility, and Virgin Mobile USA, trust Bridgewater's technology and business insight to help them deliver world-class services.

Founded in 1997, Bridgewater Systems is a privately held company.

BRIDGEWATER SYSTEMS

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WWW.BRIDGEWATERSYSTEMS.COM

HEADQUARTERS

303 Terry Fox Drive, Suite 500
Ottawa, Ontario
Canada K2K 3J1

Phone: +1 613 591 6655
Fax: +1 613 591 6656

EUROPEAN OFFICE

200 Brook Drive, Suite 102
Green Park, Reading, Berkshire
United Kingdom RG2 6UB

Phone: +44 (0) 118 925 3298
Fax: +44 (0) 118 925 3299

ASIA PACIFIC OFFICE

04-13 Technopreneur Centre
Block 1003 Bukit Merah Central
Singapore 159836

Phone: +65 6276 3447
Fax: +65 6270 3781

U.S. OFFICE

3959 Electric Road, Suite 357
Roanoke, Virginia
United States 24018

Phone: +1 540 772 3103
Fax: +1 540 725 1067