

Virtualization: The Key to Providing Tier 1 Rating Functionality for Small and “Greenfield” Mobile Operators

Whitepaper

How real-time rating, customer care, voucher management, IVR, voice messaging, conferencing, and more can be reliably combined in a single platform.

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1 Abstract

In the highly competitive small-to-medium mobile communications market, it is imperative that carriers and operators are able to quickly package, promote, and deploy new and innovative communication services based upon their unique operational requirements – and do this with minimal investment.

Operators in smaller markets, especially new or “Greenfield” operators, struggle to provide features and services that are commonplace in larger mobile markets. One key reason for this seeming disparity is that traditional full-featured solutions are generally designed for a much larger subscriber base, and include equipment and levels of redundancy in both hardware and software beyond the budget capabilities of smaller operators and MVNO’s. These traditional systems are cumbersome, offer little flexibility, are cost prohibitive, and require intensive support resources.

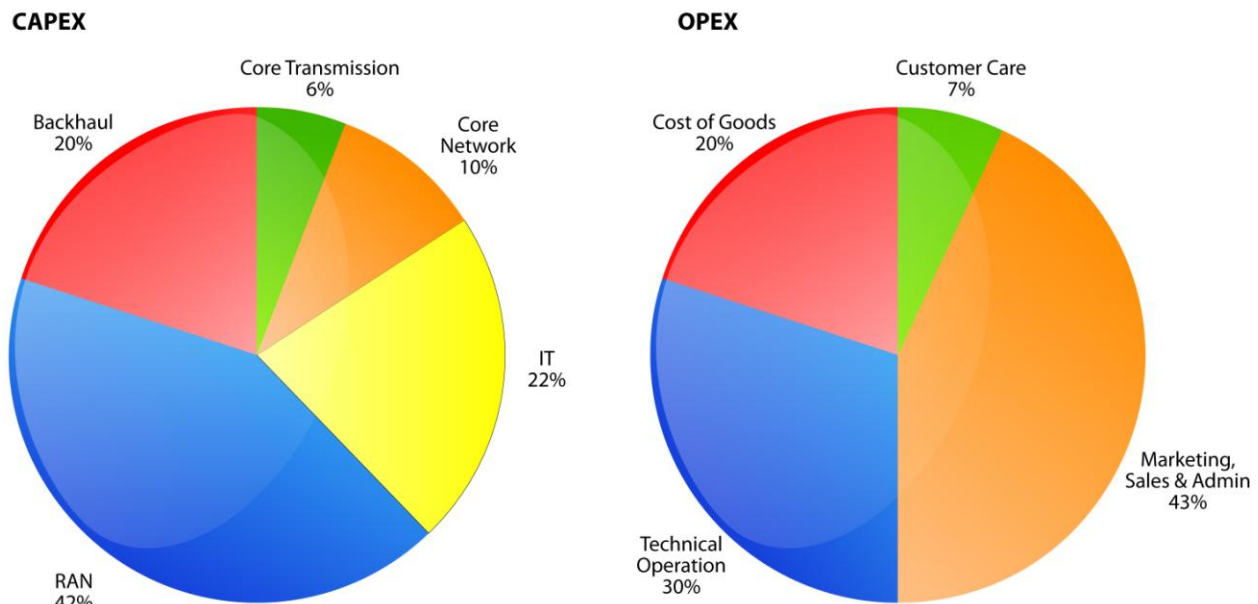
The following whitepaper will explore a different technological approach which mobile operators can leverage to provide a truly full-featured solution at a greatly reduced cost, thereby enhancing the subscriber experience, and becoming far more competitive in their market.

2 Introduction

By definition, “Greenfield” mobile operators have little or no existing infrastructure in place, so they need to acquire and implement not only a sound rating and billing system, but also Customer Care, Voucher Management, IVR, and a robust Voice Mail solution. The same challenges generally apply to MVNO’s as well. The costs can be overwhelming, and create significant hardship in simply getting the business up and running.

Typical “IT” capital expenditures for mobile operators range between 20% and 25% of their total CAPEX budget. For a small operator, IT expenditures can be double that percentage. Technical operations also consume approximately 30% of a mobile operator’s OPEX expenditures.

Typical Mobile Operator Expenses



By utilizing a virtual machine infrastructure, it is possible for mobile operators to leverage a “best of breed” communication solution that offers a significant reduction in Total Cost of Ownership (TCO) for back office operations, while at the same time maintaining the reliability, scalability, and features of a large Tier 1 carrier.

Another characteristic common to many Greenfield operators is that they grow exponentially. What started perhaps as fewer than 50,000 subscribers can quickly become 100,000 or 200,000 subs. Unfortunately, those small operators who were saddled with pre-pay and/or post-pay systems that really weren’t ideal for their needs soon find themselves boxed in by either hardware or software limitations – or both – and now have to endure system upgrades or replacements that will support their rapid growth.

3 Advantages of Virtualization

In a nutshell, virtualization saves money, energy, and space. It reduces the number of servers a mobile operator would require to support their operation, which means savings on hardware costs, software costs, and also on the total amount of energy needed to run the hardware and provide cooling.

With virtualization in place, system administrators would not have to support so many machines, reducing man hours associated with basic system maintenance so more attention can be given to strategic administration tasks. Virtualization gives the added benefit of being able to perform updates or replace components with little to no down time, reducing the costs associated with rolling out new enhancements and services, thus allowing operators to bring innovative services to market in a timely manner.

Hardware platforms today are being built with incredible power and capacity. Virtualization allows for a much more efficient use of hardware, thereby reducing overall hardware costs, operational costs, and energy costs.

4 Total Pre- and Post-Paid Solution on a Virtualized Machine

Invigorate*Plus* is the total solution from Interact Incorporated that includes all the elements needed to support small-to-medium sized mobile operators and carriers, and resides within a virtualized environment. Key elements that come standard with Invigorate*Plus* include:

Rating Engine

- **Convergent, Simultaneous Rating**

This real-time rating and management solution has the ability to support just about any voice/data rating structure imaginable, in either a separate prepaid, postpaid and/or convergent environment. Operators can increase margins by charging for more than one event taking place at a time (e.g., talking on the phone while sending an MMS, or playing an online game while receiving opt-in SMS updates of big plays happening in an ongoing football game). Invigorate*Plus* supports all the standard rating features required by mobile operators, along with a robust set of advanced rating features such as rating per minute, per transaction, or per download, location based rating; and discounts such as buy one get one free, and friends and family. From discrete per second voice services to simultaneous IMS transactions based upon time of day, bytes downloaded, geographic location, and Quality of Service (QoS) metrics, Invigorate*Plus* can do it all and much, much more.

Invigorate*Plus* can enable service providers to quickly package, promote, and discount cutting edge services, while simultaneously encouraging the use of additional revenue-generating applications. Whether these fall under the Mobile Virtual Network Operator (MVNO) variety, a TriplePlay manifestation enabling the provisioning of multiple bandwidth services and telephone services over a single connection, or an altogether different diversification strategy, Invigorate*Plus* is the answer.

Service Management Point

- **Voucher Management**

As the pre-paid wireless market becomes more competitive, operators are finding it increasingly necessary to attract higher profit subscribers and persuade them to top-up their accounts more frequently. A robust voucher creation and management system provides the means to accomplish both. With Interact’s *Redeem* Voucher Administration System, operators will be able to increase brand awareness and top-up convenience at retail merchants and point-of-sale outlets where their target market shops, as well as manage dedicated marketing campaigns for selected customer segments.

Redeem’s convenient web-based administrative front end consists of multiple screens that allow a client to generate and monitor vouchers at all times, as well as provide complete prepaid voucher lifecycle management including voucher generation, activation, recharging and deactivation of subscribers. Complete audit and tracking within this system minimizes risk of fraud and ensures security.

- **Payment Solution**

Interact understands the challenges faced by providers of real-time services. The ability to move funds from the source to the subscriber account and make them instantly available drives usage, which in turn drives additional replenishment. The delay of a single replenishment creates a negative user experience, a reduction in network consumption, and ultimately affects the operation’s bottom line. PayIN is Interact Incorporated’s solution to the multi-faceted interaction with subscriber accounts by way of vouchers, credit cards, funds and other monetary devices. PayIN also drives additional revenue by encouraging more replenishment. Full historical data allow replenishments to be tracked and subscriber patterns understood. Notifications keep subscribers informed of their status to avoid balance depletion. Promotions encourage more frequent or higher value replenishments through the delivery of real-time rewards of funds or discounted usage.

- **Customer Care**

The Customer Care module within *InvigoratePlus* allows administrators to create, view, modify, and completely manage subscriber profiles via web-based consoles. Customer Care screens themselves are incredibly flexible and can be customized to adapt harmoniously to any cultural environment. Offering support for multiple lingual notifications, and customizable web consoles, Interact works closely with service providers to construct a Customer Care medium that is “friendly” to both subscribers end users.

IVR

- **Multimedia Engine**

Blazing fast and feature rich, Interact Incorporated’s VIP Multi-Media Platform delivers high performance, limitless scalability and remarkable efficiencies to media platform requirements with its premier voice and video application processing.

The VIP Media Platform supports completely customizable voice and data processing solutions such as Conferencing, Unified Messaging, and Voice Mail – to name but a few. With VoiceXML as VIP’s underlying standardized language, service providers can easily write their own innovative applications that take advantage of the latest in automatic speech recognition, text-to-

speech, and voice synthesis technology. While at the same time, services are available to create customized applications for those who do not have the proper technical resources available.

While any number of voice applications or services can be seamlessly integrated into an operator’s existing environment, Invigorate*Plus* comes “standard” with Interact’s state-of-the-art Listen voicemail solution. Listen voicemail includes a user-friendly web interface for monitoring and managing the voicemail module, as well as a powerful list of features such as one click mailbox maintenance, optional message transcription, rapid voicemail retrieval, and much more.

The VIP Media Platform features two definitive enhancements over other multi-media solutions: increased port density and accelerated Calls Per Second (CPS) throughput.

VIP is available as either a 100% SIP solution or via rugged CompactPCI Blade architecture – or as a combined SIP/CompactPCI solution. VIP provides cost optimized port density ranging from 240 to 1,920 timeslots in a single rack-mountable virtualized platform. This spectrum of flexibility allows mobile operators and service providers to implement just the right system for any need.

Database

- **Robust and Secure Data Storage**

Within Invigorate*Plus*, all CDR’s, SDR’s, EDR’s, Transaction Logs, Subscriber Profiles, Security Profiles, Billing Profiles, and Service Profiles are stored securely (up to 3DES) in this integrated Oracle 11g-based system. Interact provides reporting tools which can access this data, to allow the operator to obtain critical information to manage and run their business.

The solution is so flexible that although it moves information real-time, it is also possible to take the database off-line for maintenance and upgrades without impact to revenue-generating rating functions... a feat well beyond the typical real-time replication server’s realm of capabilities.

System Monitoring and APIs

- **System & Network Monitoring**

As would be expected in any “Total Pre- and Post-Paid Solution” (virtualized or not), Invigorate*Plus* also includes a System & Network Monitoring module. All media platforms are continually monitored by our Realize real-time status and monitoring system, which is easily accessed via web-based consoles. Realize was developed as a web-based application, with customizable dashboards providing real-time information of various stats and operations, enabling your organization to make informed business decisions to quickly address problem areas, as well as identify emerging opportunities.

The monitoring capabilities of Realize allow multiple systems across local or wide area networks (LAN, WAN), as well as remote stand-alone systems, to be monitored and controlled at a single point. The real-time statistics from Realize can be filtered, viewed live, compiled into reports, or used to trigger alerts. The alerts can be sent out to a single individual, or a user-defined group of individuals via email or SNMP traps.

- **Open APIs**

Lastly, a critical element of a “Total Pre- and Post-Paid Solution” would have to be a realistic way to easily integrate any unique or unexpected components into the operator’s network. Invigorate*Plus* includes “Aperture”: a powerful open API solution that truly simplifies life for the mobile operator.

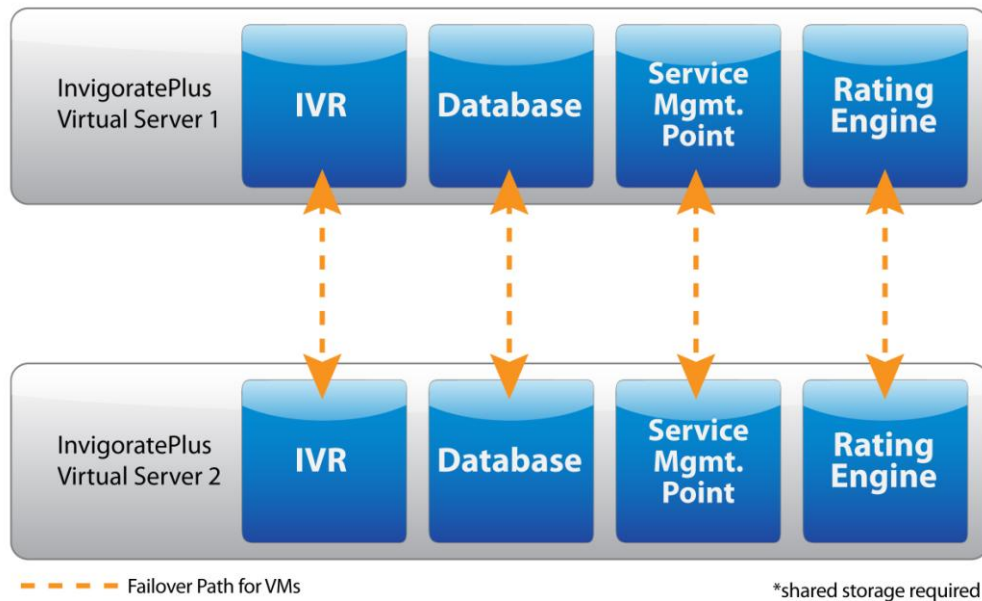
By definition, Aperture is an opening or an unobstructed view. Because the nature of our APIs reflects this definition, Aperture has become the moniker for the entire open API solution set.

Within InvigoratePlus Aperture is a select grouping of published APIs that external systems can use to control key aspects of Replenishment, Customer Care, Subscriber Management, and E-Services.

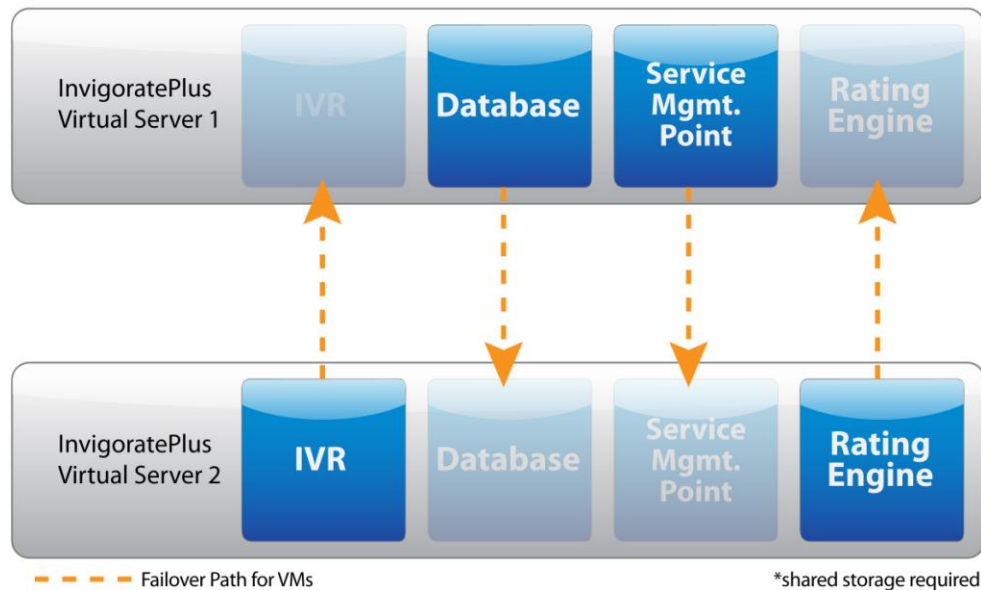
5 InvigoratePlus Implementation

The flexibility of InvigoratePlus allows for various implementation methods to suit each operator’s individual needs. Below are two examples of InvigoratePlus utilizing either Oracle ClusterWare, or Citrix High Availability for redundancy.

InvigoratePlus with Oracle ClusterWare



InvigoratePlus with Citrix High Availability Failover



6 Problem and Resolution

Problem: Operator “X” has been licensed to establish a mobile communications network, and needs to implement a real-time rating engine for pre-paid subscribers that supports both voice and data. In order to be competitive and establish a secure market share, operator “X” must also implement enhanced calling services such as voice messaging, voucher management, and conferencing. “X” has limited funds for the start-up venture, and cannot afford to acquire a traditional/legacy pre-paid rating system, plus voucher management system, plus a traditional voice messaging system, plus a multi-media server to support other enhanced calling services such as an IVR subscriber interface and conference calling.

Resolution: A “Total Pre- and Post-Paid Solution” in a virtual machine infrastructure such as *InvigoratePlus* provides all these functions and more, on just one or two rack-mounted servers – and does it for a fraction of the cost of a traditional solution achieved through a combination of multiple systems and devices. Furthermore, the footprint taken up by this virtualized solution is insignificant, and the ongoing maintenance and support costs (electrical, cooling, manpower, etc.) are greatly reduced.

7 Summary

In today’s slowing global economy, it has become increasingly important for mobile operators to provide new and innovative services in a fast and economic manner. This is especially applicable to small-and-medium size carriers, service providers, and MVNO’s.

Traditionally, excessive hardware and software requirements, along with their associated exorbitant costs, have created obstacles for the smaller operators. Now, through the technological advantages of virtualization, combined with creative bundling of software and applications, a solution is available. Interact Incorporated’s innovative architecture, flexibility, rapid customization and deployment, and ultimate cost effectiveness of *InvigoratePlus* satisfies the unique needs of smaller mobile operators. Interact has been providing feature-rich solutions to the pre- and post-paid market for more than two decades. *InvigoratePlus* is the culmination of our many years of experience.

For more information on *Invigorate*, please visit our website: <http://www.iivip.com/solutions/billing-and-rating-invigorate/>

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