The following white paper examines the development of the Internet protocol (IP) telephony market from 1995 to the present. It describes two key developments currently underway: the emergence of the three-tiered distribution network model and the integration of IP telephony with the traditional SS7 signaling network. A discussion of operational challenges in the IP telephony market follows. The paper continues with a listing of the key requirements of an IP telephony-focused operational support system (OSS) and concludes with a discussion of key criteria for IP telephony success.

We would be pleased to receive any feedback about this paper. Please send your comments or questions to info@eftia.com.

IP Telephony OSS for Real-World Success

In five short years, the IP telephony market has evolved from a hobbyist's playground to a sophisticated business—dominated by billion-dollar corporations providing service to carriers and millions of individual consumers and businesses.

The days of making easy money from international toll arbitrage are coming to an end. Margins are shrinking due to pressure from traditional public switched telephone network (PSTN) carriers, who are pushing IP telephony service providers to improve their operational efficiency and find new sources of revenue. In fact, it is projected that a significant amount of future IP telephony service provider revenues will be derived from offering a creative and ever-changing array of advanced services that take advantage of the convergence of voice and data communications. Today's service providers need to arm themselves with tools that will help them thrive in this brave new world of IP telephony. Selecting a flexible IP-centric OSS is one necessary requirement for long-term success.

IP Telephony Market Evolution

The concept of voice communication being delivered over the Internet became a reality in February 1995 when VocalTel introduced its PC-to-PC Internet Phone™ software. This software allowed two users connected to the Internet to conduct a conversation via their multimedia capable personal computers.

In 1996, IP telephony gateways were introduced. These devices provide a bridge between IP networks and the traditional PSTN, and are the cornerstone of current IP telephony networks. The Telecommunications Reform Act (US) was also introduced in 1996. It promised deregulation of the voice telecommunications market and similar deregulatory legislations in Europe. These concurrent developments enabled enterprising service providers to deploy international networks and take advantage of toll arbitrage opportunities by bypassing the access charges and international settlement fees associated with traditional long distance international calls.

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In 1999 and 2000 the IP telephony industry has experienced global expansion, with the leading service providers aggressively establishing points of presence (POP) in international cities to extend their geographical coverage. Many of these new deployments have been the result of "affiliate programs" focused on establishing relationships with local service providers in international locales.

Beyond 2000, fundamental changes in the industry will occur. Broadly speaking, the most significant trends will be

- The widespread availability of advanced communication services, such as unified communications
- The extension of IP to the local exchange providing full convergence of voice and data

These trends will be enabled by two key developments currently underway: the continued emergence of a new three-tiered distributed network model to replace the traditional circuit switching model, and the full integration of the IP telephony network with the traditional SS7 signaling network.

The three-tiered distributed network model has the following structure:

- A standards-based packet infrastructure layer
- An open call control layer
- An open service application layer

The open service application layer, comprised of programmable systems, will enable service providers to rapidly create customer services independent of hardware vendors.

The second development, the full integration of the IP telephony network with the traditional SS7 signaling network, will allow seamless integration with the PSTN network to leverage existing resources and provide a migration towards full end-to-end IP communications.

Operational Challenges

The opportunities available to the IP telephony debutantes are enormous, but so too are the challenges. Pressure from the traditional carriers is combining with the effects of deregulation to significantly reduce the once generous margins available in the international toll market. In order to grow profits, IP telephony service providers need to focus on rapidly introducing advanced communications services, and above all, achieving operational efficiency.

The key operational challenges facing today's IP telephony service providers are

- Maximizing operational efficiencies
  - – Improve the management and flow of customer and service information
  - – Make effective use of network inventory, and number and IP address inventory
- Lowering operating costs
  - – Minimize customer support staff
  - – Automate repetitive manual tasks
  - – Provide customer self ordering and trouble management capability
- Streamlining the ordering process
  - – Simplify the order-taking process
  - – Standardize order management processes with best practices
  - – Provide near real-time automatic service activation
  - – Integrate disparate support systems into an end-to-end solution
- Managing an international network of customers, affiliates and assets
  - – Support international circuit standards
  - – Support international telephone numbering standards
  - – Support international address formats
- Supporting a range of IP telephony, Internet and broadband services
  - – Support existing Internet services and emerging IP telephony services
  - – Provide flexible service bundling
- Integrating order management, number and IP address management, network inventory management and maintenance capabilities

OSS for Real-World Success

Before attempting to identify the key criteria for selecting an IP telephony OSS, it is useful to discuss the key requirements of an IP telephony-centric OSS:

- Ability to model the network and manage resource availability
- Ability to manage IP addresses, access numbers and calling areas

- Ability to model the relationships between customers, assets, IP addresses and access numbers
- Ability to support international circuit standards and telephone numbering standards
- Ability to support a rich set of application programming interfaces (API), which integrate with other solutions to provide:
  - Near real-time billing
  - Near real-time service activation
  - Automatic network configuration
  - Customer self service
  - Service level agreement (SLA) management

IP telephony is evolving quickly. The market has changed significantly in the last five years, and the next five years will prove to be even more explosive. One thing is certain: service providers will be introducing new technologies and services at an astounding rate.

IP telephony service providers can prepare for the future by selecting an OSS that is flexible. Service providers should consider whether the OSS they choose will be able to keep up and whether the OSS supplier is willing to adapt. Ideally, the system should be data driven, and the service provider should have control of that data. They must understand the data model; can it be extended? what does it take to model a new service?

IP telephony OSS vendors are focused and knowledgeable about the IP telephony market segment. They do not use a one-size-fits-all solution, and they understand that a traditional circuit-switched voice provider system is not going to meet the needs of an IP telephony provider. Superior OSS vendors are committed business partners. Together, the OSS vendor and the IP telephony provider work for mutual benefit to improve both products and services.

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Eftia is a leader in developing, deploying and managing OSS products designed to meet the service management and delivery needs of tier one, wireless and next-generation service providers.

The Eftia Master.Scribe® Suite of integrated OSS products provides comprehensive order provisioning and fulfillment; problem management; telecom circuit and asset inventory management; and Internet protocol (IP) address and telephone number management. Eftia also offers Master.Xchange, a configurable OSS interconnection gateway.

If you would like to learn more about Eftia's OSS solutions, please visit www.eftia.com or contact us at 1-888-423-3842.

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