

Product Bulletin

Integrated VoIP Gateway Solutions

Most of the early VoIP gateways were implemented to support international minutes of voice either as call termination for major carriers or as low cost voice for consumers. These early gateway implementations seldom provided more than T1 channel densities.

Today, VoIP gateways are being implemented in platforms that range from small two port Integrated Access Devices (IADs) up to high density carrier class gateways used as Class 4 and Class 5 switch replacements. Integrated silicon and software technology for VoIP has evolved to support hundreds of channels and will soon support over 2000 channels on a single chip.

VoIP Gateway Market Growth

The growth in VoIP Gateway deployment has been dramatic since this technology was introduced in 1995. The VoIP market is expected to grow from 7.7 billion minutes last year to 500 billion minutes by 2005, according to Probe Research. Probe Research also forecasts the market for VoIP gateway equipment to increase from \$1.2 billion in 2000 to \$10 billion by 2005. According to Cahners In-Stat Group, the market for VoIP-enabled customer premise equipment gateways is expected to increase from 491,000 units shipped this year to 14.1 million units expected to ship in 2005 with

annual sales of \$3.2 billion in 2005. Frost & Sullivan forecasts the small and medium enterprise equipment market to increase from 2.4 million ports in 2001 to 27 million ports in 2005, and the high density market to grow from 10.4 million ports expected to ship this year to 157.7 million ports projected to ship in 2005.

Even so, the market for VoIP Gateways is still considered to be in its early stages. The stage however, is ever more crowded with big players, new entrants, intense competition and high stakes for equipment manufacturers.

Fostered by hand-in-hand improvements in DSP technology and VoIP software, today's gateway OEMs recognize the necessity of integrating in a cost-effective fashion complete solutions which optimize power, area, channel density and high quality VoIP software features. In other words, affordable solutions built on total solution density. Solution density refers to optimizing area per channel, power consumption, architecture and cost to support the features required by OEMs producing true toll quality gateways. As a result, scalability has improved, price points have dropped, and a full range of high quality voice features are available for a wide variety of VoIP applications. These applications range from the low channel requirements of

customer premise equipment (CPE) mandated by the proliferation of such enabling technologies as DSL and Cable to the high density requirements of service providers.

Service providers have a great deal to gain with the new generation of platforms. They can realize new revenue opportunities in leveraging the open architecture of packet-based services to quickly bring to market new and enhanced services, while simultaneously saving money by deploying packet-based networks. Operating costs are estimated to be 40-50% lower for packet-based, converged networks.

As the VoIP gateway market continues to mature, new gateway solutions will evolve to support multiple WAN networks and multiple signaling protocols (i.e. voice/fax over IP and voice/fax over ATM coexisting in the same gateway). New generation gateways may also be hybrid devices where other services are combined with gateway functionality as, for example, gateways implemented with Softswitch services.

With these new generation gateways, intelligence is moving from end devices into the network. This allows the end devices to be produced at a lower cost while expanding services and features. Much of this network intelligence is implemented in VoIP gateway devices.

Gateway Market Segments

VoIP gateway applications include three distinct market segments: Residential/SOHO equipment, small and medium enterprise equipment (SME), and high density carrier class equipment. It is important to note that the requirements are unique for each segment.

For all three, TI provides complete, integrated silicon and software solutions based on our family of programmable, DSP-based access communication processors and Telogy Software™ products. TI is the only provider of gateway solutions with a complete product portfolio for all three VoIP gateway market segments.

TI's gateway solutions provide optimized architectures and features required for residential/SOHO, SME and high density carrier class equipment. These complete solutions deliver the quality of service required in today's competitive environment. True toll quality is achieved through a thorough implementation of voice features, which enables VoIP telephony to meet or exceed quality levels expected in modern telephony systems.

In addition to carrier class PCM voice, these gateway solutions support low bit rate codecs and fax relay. TI's gateway solutions are designed with an emphasis on solution density -- an optimized design that addresses channel density, power per channel, solution architecture and carrier class features to deliver a complete solution at an optimized density for a specific application -- rather than just channel density.

Integrated Silicon and Software Solution

TI's VoIP gateway solutions are complete, integrated silicon and software solutions based on TI's TNETV1010™, TNETV2020™ and TNETV30xx™ series of DSP-based programmable access communication processors, integrated with Telogy Software™ products.

Our position as world leader in silicon technology means customers benefit from integrated solutions which offer the lowest power and highest area per channel.

TI's VoIP gateway solutions are the industry's most comprehensive VoIP product suite, enabling true toll quality VoIP services. By using TI's

DSPs integrated with Telogy Software products, voice and fax over IP gateway equipment manufacturers are enabled with a superior solution and significant time-to-market advantage.

TI Gateway DSP Roadmap

TI is building on our industry-leading TMS320C54x™ and TMS320C55x™ DSP architectures by developing a series of devices specifically for the multi-service platforms, such as gateway platforms, that are building the voice/fax/data convergence infrastructure.

Multi-service platforms are multi-channel voice and fax systems used in gateway platforms, voice gateways/ switches/ routers, PBXs and other packet network applications.

The C55x DSP core slashes power consumption up to one-sixth of the C54x core and its dual-MAC architecture has double the number of functional units for increased parallelism.

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