

## Product Bulletin

# UR8 Residential Gateway Architecture: Voice, Data, Video, Wireless

To capitalize on the rapid growth of broadband markets worldwide, gateway suppliers are striving to respond with a diverse product line capable of serving all regions of the world and, at the same time, meeting the specialized requirements of narrow market segments that demand distinct product requirements. Texas Instruments (TI) addresses the needs of these manufacturers with its new UR8 residential gateway (RG) architecture, a complete system solution that has the flexibility to serve as the basis for an extensive gateway product line while minimizing development costs through considerable hardware and software re-use.

Built on the proven technical and market leadership of TI's AR7 family of residential gateway products, UR8 provides an unmatched level of performance and integration for the most demanding gateway applications, including voice, data, wireless and video. Each product in the UR8 family comprises an advanced multimedia gateway processor, a programmable DSL PHY, a

high-performance DSP-based voice sub-system and a rich set of standard interfaces. A well-defined API reduces time-to-market by allowing maximum hardware and software reuse across all DSL platforms.

### ***TI Leadership in Residential Gateways***

The UR8 architecture leverages the extensive market acceptance and leading performance of TI's AR7 product family. Manufacturers can be assured that in addition to the same high quality, interoperability and extended rate and reach of AR7, the UR8 architecture delivers support for additional DSL technologies and includes Voice over Internet Protocol (VoIP) processing integrated into the architecture.

It's critical to enable the interoperability of an RG with infrastructure systems as well as with locally connected devices (such as media appliances). TI leads the market with the highest level of interoperability in the industry. Service providers have counted on TI's DSL interoperability through seven generations of products, and manufacturers look to TI for its extensive

### ***Key Features***

- Next-generation residential gateway (RG) architecture supports multiple-access media (xDSL, fiber, Ethernet) and multiple services (voice, data, video, wireless).
- High-performance multimedia gateway processor doubles the processing power of current generation RG solutions and provides headroom for additional value-added applications.
- TI's worldwide xDSL interoperability footprint assures continuity of service when upgrading new services to existing customers.
- Robust and uninterrupted real-time IPTV over xDSL.
- Flexible platform maximizes software and hardware re-use across products for various service levels, applications and specialized market segments.
- TI's Telogy™ software running on a dedicated, high-performance DSP provides up to four lines of carrier-class voice with advanced features.
- Extensive voice CODEC library supports narrow band (4 KHz), wide band (12 KHz) and wireless CODECs for advanced applications such as fixed-mobile convergence.
- TI's PIQUA™ software: Embedded elements that monitor and repair voice and data services.

interoperability footprint.

Beyond TI's vast expertise in broadband access, UR8 capitalizes on the company's leadership in a number of related technologies, including IP routing software, high-speed

and robust 802.11 wireless local area networking, (WLAN) Wi-Fi technology, VoIP solutions and TI PIQUA™ quality-management elements, and many other technologies proliferating in today's digital homes.

In addition, UR8 solutions come with a set of development boards and hardware and software collateral that enable manufacturers to differentiate their RG products and re-use engineering resources, resulting in manufacturing efficiencies and faster time to market.

**Multiple Access and Multiple Services**

The UR8 architecture serves as the foundation for a full family of residential gateway solutions, allows manufacturers to deliver numerous designs to meet the growing needs of operators. UR8's open, scalable platform gives OEMs and ODMs the flexibility to design RGs with multiple variations of feature functionality, including advanced video services and outstanding voice capabilities.

In addition, the UR8 also has a rich set of standard interfaces to support triple-play deployments over multiple local area networking (LAN) media (such

**Key Benefits**

- **High-performance processing**
  - High-performance multimedia gateway processor has headroom for value-added features
  - 2X improvement in bridging/routing compared to current-generation of RG
- **xDSL subsystem**
  - Extends TI worldwide ADSL interoperability footprint
  - Maintains TI leading rate/reach for long loops
- **Dedicated VoIP subsystem**
  - High performance C55 DSP running Telogy software
  - Flexible CODEC configuration
  - Up to four VoIP channels with advanced features such as three-way conference and high-quality echo cancellation
  - V.34 fax and modem relay support
  - Industry's most robust VoIP solution field-proven over many years
  - PIQUA voice quality-management technology
- **Extensive library of low-bit-rate, wireless and wideband voice CODECs**
  - Supports fixed-mobile convergence
  - Future-proof solution for changing market requirements
- **LAN interfaces**
  - Two Ethernet MACs with MDIO
  - USB 2.0 with OTG capability
  - High-speed VLYNQ™
  - UART
  - SPI
  - PCI

as Ethernet, HomePlug®, MoCA®, HomePNA™ and WLAN) in the residence or small office/ home office. PCI and two Ethernet MACs provide connectivity to all available

home networking technologies, including USB 2.0 On-the-Go (OTG) to connect to RG storage, printers, computers and other external devices.

With processor ranging speeds up to 450 MHz, the UR8 allows deployment of many advanced applications, such as IP-based television broadcasting, multiple channels of voice, storage, printing and music without quality degradation in any of the services. UR8 also enables RGs that support multiple connection technologies to the home, including ADSL, VDSL, Ethernet and PON. Overall the UR8 product family provides unmatched levels of integration and performance for next-generation RGs.

<b>WAN Interfaces</b>	ADSL, 2/2+ VDSL2 MII for Broadband Home Router
<b>LAN Interfaces</b>	Two MII (for Ethernet, HPNA and others) VLYNQ™ (for other TI devices) PCI (for WLAN, HomePlug, MOCA and others) USB 2.0 SPI UART

**Figure 1: UR8 Interfaces**

## Residential Gateway Architecture

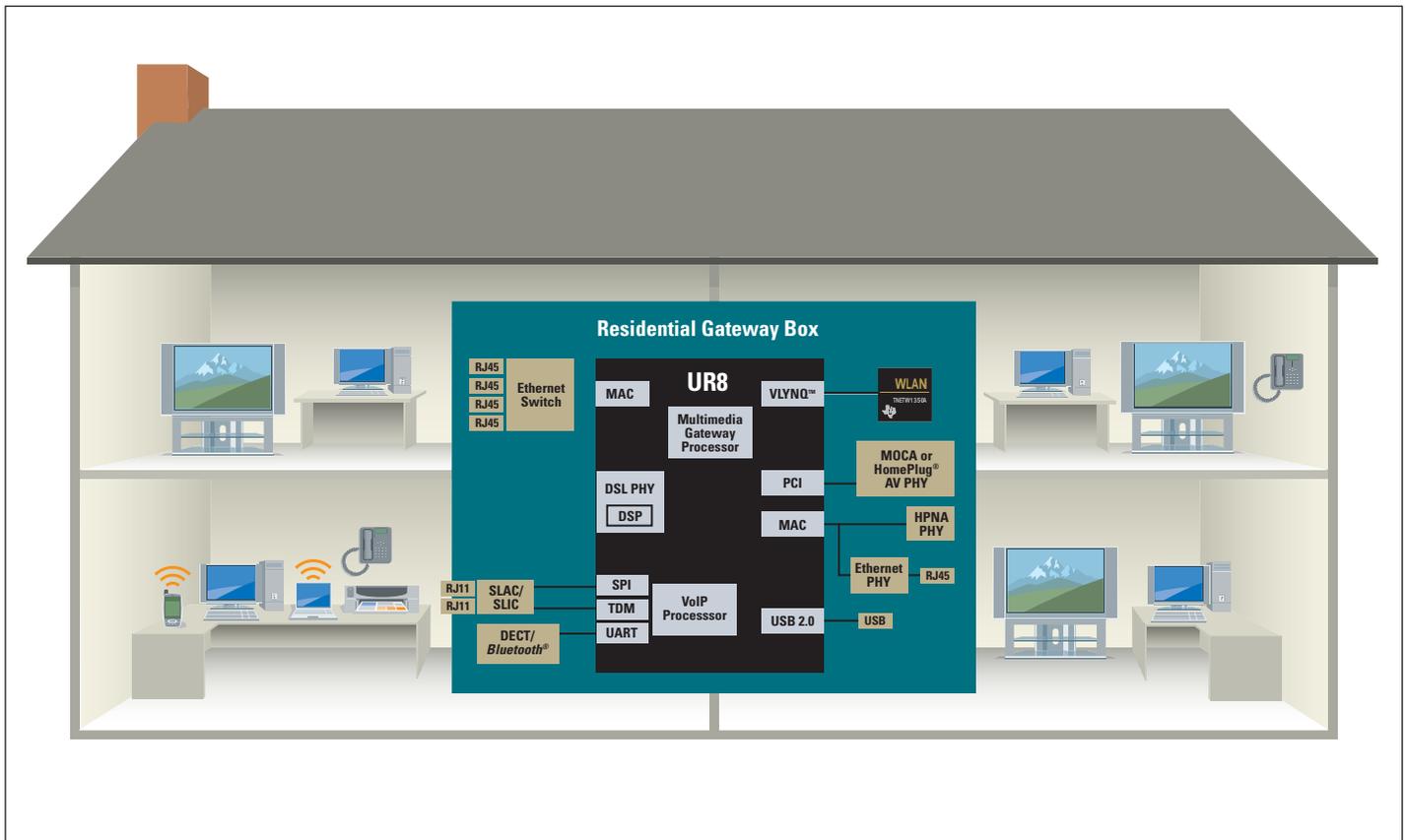


Figure 2

### Unmatched Voice Quality

With nearly 200 million VoIP ports already installed, TI's combination of a full-featured VoIP software suite running on powerful DSP hardware delivers the kind of high-quality experience that consumers have come to expect from voice services. And operators know that the slightest degradation in voice quality can accelerate departures in a user base accustomed to reliable and crystal-clear voice service.

UR8 integrates a cache-based VoIP system, which allows unrestricted deployment of CODECs and features in the RG. Combined with a high-performance voice DSP dedicated for VoIP, the UR8 architecture provides an exceptional solution that supports up to four voice channels with advanced features on each line such as three-way

conferencing, low-bit-rate CODECs, advanced echo canceling and more.

UR8 solutions also support a wide array of wireless CODECs, enabling it to act as a hub for fixed-mobile convergence (FMC) applications.

As in all TI VoIP products, TI's rich portfolio of technologies and patents in the VoIP space and other related technologies allows TI to offer along with UR8 an industry-leading indemnification for VoIP.

For service providers, TI's PIQUA quality management technology plays a central role in detecting, diagnosing and adjusting the quality of voice channels in real-time. Because of TI's unique position at all levels in public and private Internet Protocol (IP) networks from infrastructure systems to customer premise equipment

(CPE), PIQUA is able to gather the performance data that is the basis for every operational management system.

UR8 utilizes TI's PIQUA quality management elements to diagnose and monitor the various QoS parameters related to the IP services it supports and report quality information via standards based communications to Operator network management systems. For example, DSL features like TR-069 and WLAN QoS parameters are tracked and reported to enable the Service Provider to ensure a positive subscriber experience with their IP services provided.

### For More Information

For more information on TI's UR8 quality management technology, please visit [www.ti.com/UR8](http://www.ti.com/UR8), or contact your local TI representative.

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