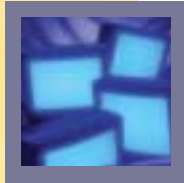


OPENTV
NETWORK SOLUTIONS

IT'S THE

EXPERIENCE.™

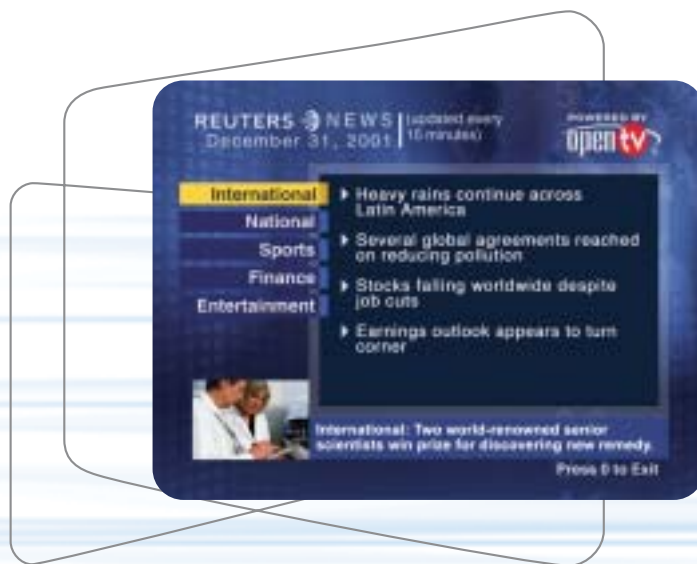
THE **BUILDING** BLOCKS FOR EVEN BETTER INTERACTIVE TELEVISION



OpenTV, the world's leading interactive television company, has been making iTV work over digital networks since 1996. At the core of the OpenTV platform are OpenTV Network Solutions, the primary building blocks of a profitable iTV service.

Provided separately or as an integrated bundle, OpenTV Network Solutions include three key components that have combined to bring interactive television into millions of households throughout the world.





News Application

OPENTV STREAMER: BRINGING INTERACTIVE TV HOME

OpenTV understands that the mass medium of television is primarily a broadcast medium. This is what enables TV to efficiently reach literally billions of people every day. So we engineered our basic iTV delivery system, OpenTV Streamer™, to take advantage of the way you already operate your network.

In fact, OpenTV Streamer lets you deliver an array of rich iTV services – from TV show enhancements to an EPG (Electronic Program Guide) – without ever requiring your customers to use an upstream communications path. It's a key architectural distinction between OpenTV and other iTV systems. With OpenTV Streamer, when customers click on a menu of breaking news from a newswire service, they're actually tuning in to a broadcast data stream. No upstream path is required. And what appears to be a live, two-way dialogue is in fact a one-way broadcast of digital data that delivers a satisfying, highly responsive iTV experience.



HERE'S HOW IT WORKS:

1. Authoring.

Offline and away from your network, a myriad of content developers produce the underlying resources of iTV. They're writing news stories, creating games, refreshing horoscopes and building enhanced TV applications literally around the clock. Of course, with support from OpenTV, you can also write your own customized iTV content locally. Without any imposition on your network.

2. Distribution.

These content resources are swept into a data carousel that broadcasts them to all users all of the time. It's all about scale: In the same way that any broadcast TV program is available to an infinite number of viewers, each data module housed on the carousel can be viewed and used by an unlimited number of customers – with no need for a live, two-way network session or for multiple copies of the same content. And because OpenTV Streamer performs real-time compilation of these interactive data modules, it allows up-to-the-second transmission of sports scores, weather reports and other time-sensitive information.

3. Downloading.

Once a viewer selects interactive content, the digital set-top box grabs an OpenTV application from the broadcast signal. We've made these applications thrifty enough to reside comfortably on today's standard digital set-top boxes – one of the reasons that OpenTV is now present in well over 20 million set-top boxes worldwide. Once it's loaded, the application operates within the set-top box as a "virtual machine" that can carry out instructions and perform operations on the data stored by the carousel.

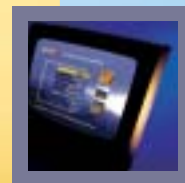
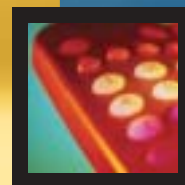
4. Playing.

When a viewer grabs a breaking news story from the carousel, the corresponding application presents it in a rich visual format on the TV screen. When the same viewer opts to scan current baseball player statistics during the game, another application will load, displacing its predecessor and interacting with new data plucked from the carousel. With OpenTV Streamer, the set-top box isn't sending a constant volley of messages back up the network. It's merely fetching what it needs – application and content alike – from the broadcast carousel. There's no dedicated session established, and no discrete allocation of your bandwidth required. And the content is multiplexed within MPEG streams that already are coursing through your network to deliver video and audio resources in the first place.

5. Finishing.

Once the viewer reverts to a normal video channel, the application is simply flushed from the set-top box memory.

The customer has just completed an engaging, responsive iTV interplay without ever requiring an upstream channel. For a large majority of iTV applications and content, this broadcast-style architecture performs extremely well.



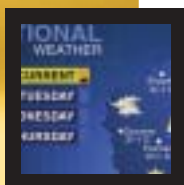
OPENTV PUBLISHER: DECIDEDLY DYNAMIC

Producing or importing updated content for availability via your iTV service is the job of OpenTV Publisher™. It transforms web-based content into broadcast-ready iTV applications, enabling you to integrate a whole new range of dynamic, real-time content and information into your iTV offering.

OpenTV Publisher provides fast, flexible application development and supports automatic, real-time content updates, so that information is always current. With OpenTV's content publishing solution, you can turn web content and applications into branded iTV services; deliver interactive, up-to-date information services such as news and weather; add real-time scores and stats to live sports broadcasts; or enable a full range of t-business applications.

Incorporating the page paradigm and HTTP protocol already familiar to web engineers and designers, OpenTV Publisher uses components that transform existing XML data – the underlying format for a wide assortment of dynamic web information and content – into iTV applications. The process of creating an application with OpenTV Publisher is both modular and incremental. Applications are built using templates defined in XML by application designers.

OpenTV Publisher is the most cost-efficient, end-to-end solution for real-time information publishing. By using OpenTV Publisher, you can fashion a rich portfolio of content ranging from international to local, with rapid-fire updates that transform the television into an instrument of knowledge and responsiveness.





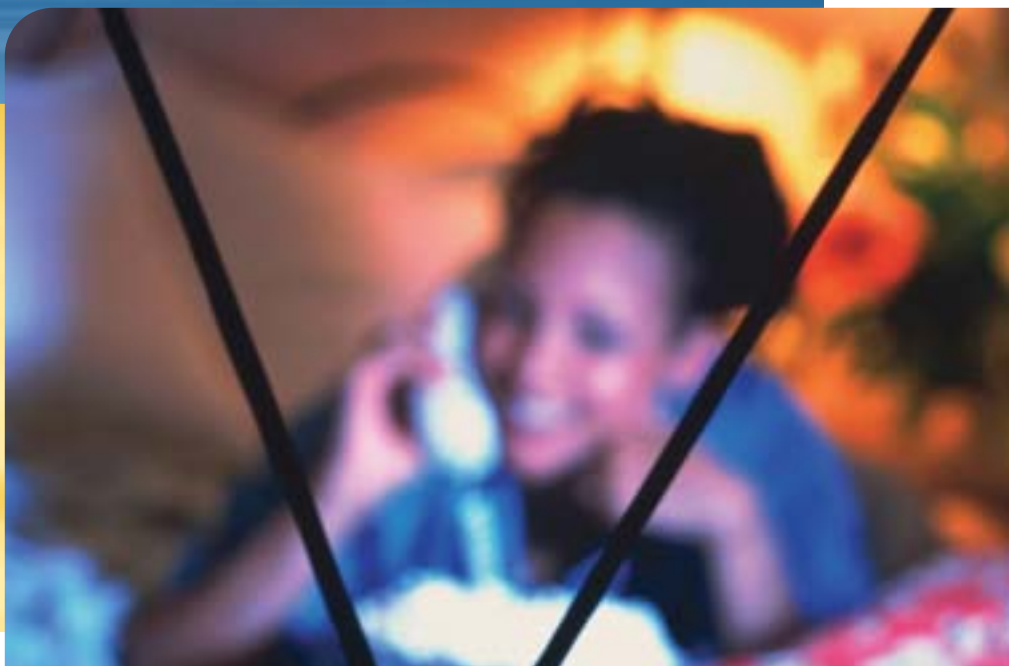
T-Commerce Application

OPENTV GATEWAY: TIME TO TRANSACT

Many digital set-top boxes don't have built-in HTTP support. Yet there certainly are times when your customers need a data conduit back up the network: to interact with a web application server, to send an e-mail, to dispatch an instant message. For t-commerce and other iTV applications that require an upstream message from the subscriber, OpenTV Gateway™ provides an integrated solution that's been market-proven across a wide range of digital set-top box platforms.

OpenTV Gateway manages and integrates the communication traffic from standard set-top boxes to standard e-mail and commerce servers, and translates transactions to standard Internet protocols such as HTTP and SMTP.

OpenTV Gateway can be integrated with set-top boxes that require a telephone return path, or into two-way RF set-top boxes using the appropriate communications protocol.



THE **POWER** OF THREE

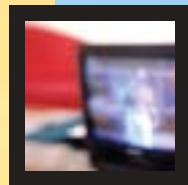
These three components – OpenTV Streamer, OpenTV Publisher and OpenTV Gateway – represent the primary building blocks of a proven interactive television delivery service. The OpenTV Network Solutions family simplifies the business of iTV by integrating essential application development, broadcast and (where necessary) return path protocol features into one operating environment.

OpenTV's Network Solutions components make building, supporting and broadcasting a broad array of iTV services easier and more efficient than ever before. OpenTV Network Solutions components combine the latest iTV technology with today's Internet protocols to create compelling interactive applications at minimum cost, and provide you with the ability to broadcast multiple streams of data reliably and efficiently.

GRACEFUL INTEGRATION WITH EXISTING RESOURCES

Designed to encompass the essential building blocks for successful iTV deployments, the various elements of our Network Solutions family integrate with the OpenTV Enterprise Solutions software, OpenTV Applications and third-party applications that are designed using OpenTV development tools to provide the complete iTV environment.

OpenTV's Network Solutions components also work with existing Internet technologies and are designed to work with other pre-existing business and operational support systems solutions that may already be in place: traffic, scheduling, headend, database and communication software, and more.



Information Application

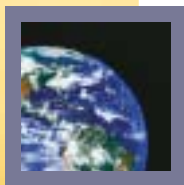
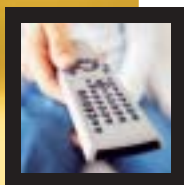


Weather Application

SOLUTIONS THAT **GROW** AS YOUR BUSINESS CHANGES

OpenTV has the expertise to help you launch iTV services quickly, effectively, and profitably. We design solutions that grow with you as your infrastructure and needs change. OpenTV Network Solutions components speed the initial deployment of iTV services, allowing you to recoup investments by producing immediate, incremental revenues from iTV services. With OpenTV Network Solutions, applications and services are easy to change and cost-effective to run and maintain.

OpenTV technology can support an installed base of existing thin-client set-top boxes today and gain additional value from the latest generation of advanced set-top boxes in years to come. With OpenTV you can incrementally phase in new components onto increasingly sophisticated set-top boxes and maximize your investment over time.





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