

# Asia IP-STB design calls for flexibility

By Roger Gregory  
Marketing Manager  
Home Media Devices & STB  
NXP Semiconductors  
E-mail: [Roger.Gregory@nxp.com](mailto:Roger.Gregory@nxp.com)

The growing popularity worldwide of content and services delivered over Internet Protocol (IP)-STBs presents a unique set of market opportunities and engineering challenges. IP-STB design involves more than hardware expertise. Software, including middleware, and applications expertise in both entertainment and communications technologies are also essential to market success.

For Asian engineering teams developing IP-STB designs, the challenges are compounded by different usage scenarios from country to country, a considerable number of delivery infrastructures and a variety of standards.

Beyond those considerations, ODMs must address the consumers' favored connectivity scenarios: Should the box include VoIP? Should it include DVB reception, a personal video recorder (PVR), connectivity through USB or Wi-Fi, digital media adapter functionality, or some combination of these and other options? What software should run on the IP-STB?

China, Japan, Korea, India and the rest of Asia may be at different points in their IP-STB journey, but the destination is the same: A connected world with all content types and services available anytime, anywhere—and delivered with the highest-quality images and sound. The applications mix may include entertainment, information, education, images and IP services.

In each example, the IP-STB design is driven by a combination of A/V compression standards, standard- (SD) or high-definition (HD) displays, cable, fiber or telephone line delivery, connectivity options, security, and—although it is often overlooked—the pri-

mary types of content available in the country or region.

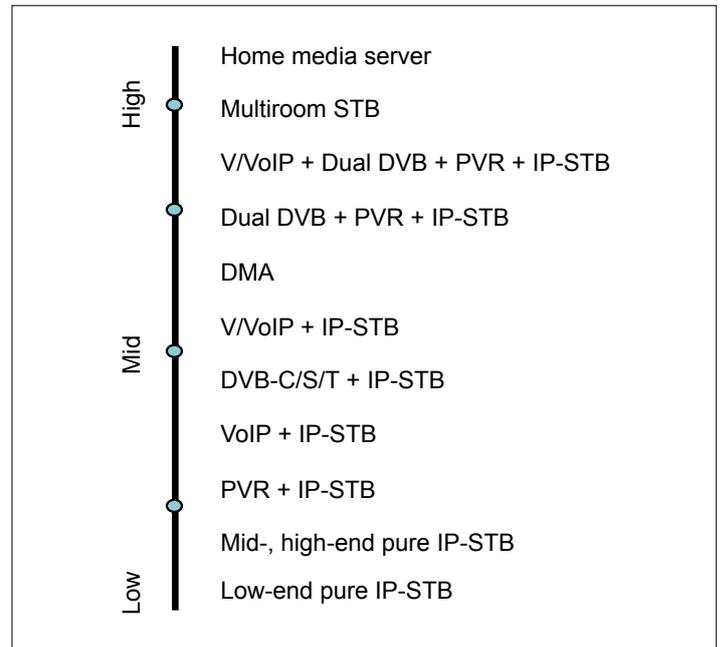
## Assorted options

China and India have the most diverse set of usage and technology scenarios of any Asian market. Although fiber infrastructure continues to be installed in metropolitan areas, many remote regions are still using analog cable for delivery.

China developed its own compression standard, Audio and Video Coding Standard (AVS), and its design houses are just emerging from a period when most IP-video products were designed for PCs.

The universal desire for a more vibrant viewing and listening experience is certainly pushing designers away from the PC and toward the STB. But most ODMs would like to carry their Windows or Linux design expertise with them to the new platform. Windows CE or Linux would likely be their choice for an OS if it is available to them.

Most households in China and India still have SDTV sets in their homes, one of the reasons why most design houses put HD implementations on the back-



Integration of connectivity and convergence devices serves as a yardstick for the IP-STB market.

burner. Also, these countries are not yet deploying a significant amount of HD content, and will not do so for a few years.

## Connectivity rules

As much as any other Asian geographic market, Korea and Japan occupy the high end of the IP-STB spectrum. For content distribution, each has a large installed

base of fiber to the home and a large and growing inventory of HD programming to pump through it.

To a large extent, the baseline STB question of video delivery is easy to answer in Japan and Korea. But that's where the easy part ends for designers.

The consumer behavior that really sets these two markets

- **Applications**
  - HD triple-play IP-STB, hybrid IP/DVB-STB, PVR, home media center
- **Video decode**
  - H.264 HD, VC1/WM9 HD, MPEG-2 HD, DivX Hi-res
- **Connectivity**
  - USB 2.0, SATA, Ethernet (MAC) GPIO-on-chip
  - Wireless 802.11a/b/g/n
  - UPnP/DLNA
  - HDMI on-board
- **Software**
  - Linux 2.6 + CE Linux Forum APIs
  - WinCE 6.0 + DirectShow APIs
- **Security**
  - DVB-CSA, DES/3DES, AES, secure boot, OTP, secure key handling
- **Digital rights management**
  - Windows Media DRM
  - DHCP/IP

IP-STB design confronts developers with various options.

apart is the availability of electronic gear of all types—and the financial resources to afford them. This makes choosing the right connectivity and convergence options a critical decision for design teams. Beyond that, they need to use a platform that allows virtually any combination of those options so that they can respond quickly to the changing market.

Integration of PVR and connectivity functionality is important to consumers who have a media-anytime-anywhere

lifestyle. Consumers will then be able to use the IP-STB product just as they would use “legacy” devices such as VCR or DVD recording, but in “all-digital” design without the need of physically inserting media into the consumer equipment, since all is recorded onto the IP-STB’s hard disk and distributed through networking technology to other digital receiver products.

In these designs, IP content becomes the backbone, while support for the broadband

triple-play being offered by carriers becomes the baseline configuration. This alone calls for a sophisticated, flexible design platform.

The addition of support for other technologies, content types and services, communication with VoIP, connectivity to portable products such as PSP or iPod, PVR, connectivity to the PC, gaming, and karaoke all ratchet up design sophistication to unprecedented levels.

In addition, designers must integrate other technologies into

the STB that are “hidden” from the consumer. These include digital rights management, security, OS and middleware.

One thing is clear to ODMs designing for the vast, diverse and ever-changing Asian markets: Every new IP-STB design cannot begin from scratch. Design reuse is a necessity, but even that is not enough.

A platform approach is just as important, and the platform should be flexible enough to accommodate fundamental shifts in market dynamics.