

OCAP

OCAP

THE **OCAP** PRIMER

OCAP

OCAP

OCAP

OCAP

OCAP

OCAP

The Gateway to Interactive Content

A Guide to the OpenCable™ Application Platform

- Why OCAP Matters
- OCAP: The Basics
- ETV and OCAP
- Getting Ready for OCAP
- The Value Proposition
- What OCAP Enables
- What's Next

Based upon The OCAP™ Primer
web site commissioned by

CTAM HOW CABLE GROWS

CableLabs®
...Revolutionizing Cable Technology®

Published by **Interactive TV Works**

Offering OCAP solutions for
the digital world...

...from the leaders in
emerging video technology!

itaas offers a comprehensive suite of iTV services and VOD products.



itaas

Your Gateway to the Interactive Future. Today!

itaas Inc. 6470 E. Johns Crossing, Ste 370, Duluth, GA Tel: 770.368.4024 Fax: 770.246.0616 www.itaas.com

Why OCAP Matters

OCAP™, formally known as the OpenCable™ Application Platform, promises to dramatically increase cable's capability to create and deploy an array of exciting new interactive services for consumers.

OCAP establishes a common software platform that enables cable companies, network programmers, consumer electronics companies and others to extend interactivity to television and many other devices. With the technology comes an array of new business and revenue opportunities.

The cable industry is gearing up for initial technical preparations and OCAP applications trials this fall. OCAP also plays a key role in the ongoing relationship between cable and consumer electronics companies to enable interactivity in TV sets and other devices. So having a basic understanding of OCAP is vital to the future plans of all players in cable and related industries.

The Cable & Telecommunications Association for Marketing (CTAM) and CableLabs commissioned The OCAP Primer web site (www.ctam.com/ocap), written by veteran cable writers Leslie Ellis and Craig Leddy to provide answers—in plain English—to key OCAP questions. The web site is sponsored by major companies, including Aptiv Digital, Motorola, NDS Americas, Scientific Atlanta, a Cisco Company, Vidiom Systems and Zodiac Gaming.

This special print report supplements the web site content. Included in this report is a look at how enhanced TV (ETV) specifications can be used as a stepping stone to OCAP content deployment. This report is sponsored by itaas, Motorola, and NDS Americas and is published by Interactive TV Works.

We hope this report helps you and your industry colleagues to gain a better understanding of emerging interactive business and marketing opportunities. If you have questions or comments, please contact Craig Leddy of Interactive TV Works, at cleddy@interactivetvworks.com.

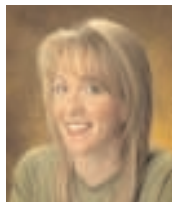
Table of Contents

4	OCAP: The Basics
6	ETV and OCAP
8	Getting Ready for OCAP
9	The Value Proposition
10	What OCAP Enables
11	What's Next



About the authors

Craig Leddy, editor of the OCAP Primer, is president of Interactive TV Works, Inc. Based outside of New York City, Interactive TV Works provides professional writing, marketing and sales support, strategic consulting, and industry education in support of advanced cable services. Leddy, who has more than 20 years of cable experience, is a veteran business writer who currently serves as editor of the CTAM Business Services Advisor and lead instructor for How Cable Goes to Market, a training course about the inner workings of cable.



Leslie Ellis, lead writer of the OCAP Primer, is senior technology advisor for CTAM, bridging the gap between cable marketing and engineering. An independent technology analyst and author based in Denver, CO, Ellis writes a popular bi-weekly column for Multichannel News called "Translation Please," aimed at demystifying cable and broadband jargon. Her writing credits include "Definitive Broadband" (2001), "Definitive Broadband: Next Generation" (2005), "The Field Guide to Broadband" (2002), and "Planet Broadband" (2003). She is a regular contributor to CED Magazine and a contributing research analyst for Bear Stearns Inc.

Designed by Black Walnut Design, blackwalnut@verizon.net

© Copyright 2006 Interactive TV Works, Inc. All rights reserved. OCAP and OpenCable are the trademarked property of CableLabs.

The Basics

Think of OCAP as simply being software—and an opportunity for a new wave of interactive content

What is OCAP—and why should I care?

The OpenCable Application Platform (or OCAP, pronounced oh-cap) is a way for cable networks, cable company applications developers and other content providers to create and deploy a wave of interactive services that will open up new revenue streams and other business opportunities.

OCAP is comprised in a voluminous set of technical specifications created by CableLabs, a cable technology consortium, and endorsed by the Society of Cable Telecommunications Engineers and other industry groups. (Specs are available through The OCAP Primer or CableLabs web sites.)

Those specifications are the basis for two primary sets of software: middleware, and applications software and content authoring tools. The bulk of the software is based upon Sun Microsystems' Java, which is already widely used by many developers to create content for TV, personal computers, game players, mobile phones and the web.

There are lots of complexities to OCAP but at its core is a very simple goal: Put OCAP middleware into various devices and use OCAP authoring tools to create interactive content so it will run on those devices.

What does OCAP middleware do?

Middleware is software. What's "middle" about it is where it sits relative to other software that may be inside a set-top box or TV.

Applications, like a programming guide, an on-demand ordering system, interactive local news and weather or whatever else, are above the middleware. Operating systems (OS) are below it.

The job of the middleware is to translate what lies at the root level for what sits above it—so that, say, an interactive trigger from a programmer doesn't need to know what version of OS a particular make of an HDTV set or a cable set top is using.

So, for example, the middleware helps an interactive game to run on a cable set-top box, or an "interactive digital cable ready" device, and interact with a cable system, provided there's compatibility all around.

To promote compatibility all around, OCAP middleware can be put into set-top boxes, TV sets, game consoles, digital video recorders, personal computers, portable devices, wireless phones or many other gadgets.

4 OCAP

So OCAP creates a means to establish a standardized, national—and even international—platform to launch all sorts of interactive services on all sorts of digital devices.

Cool. But why do we need OCAP?

For decades, cable companies, network programmers, consumer electronics companies and computer software makers have sought to deploy interactive TV services on a large scale. Many of their efforts have borne fruit with new interactive games, news and local information, sports statistics, advertising, shopping, program guides, music, polling, banking and other television enhancements.

However, developers have run into barriers to widespread deployment of their interactive applications. If they create an application to run on one particular make of set-top box, middleware platform or digital device, their application may not run on other makes of set tops, middleware or devices. Writing and deploying applications for multiple platforms is time-consuming, burdensome and costly.

OCAP provides the means for developers to "write once, run anywhere." While there may be some variations in the way that cable companies and device makers utilize it, OCAP currently represents the best opportunity to establish a widespread, standard platform for new interactive TV services—and the business opportunities that come with them.

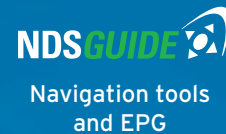
OCAP proponents believe that it will do for TV in the United States what DOCSIS standards have done for advancing high-speed Internet access and what DVB-MHP is doing for TV in Europe. In fact, much of the OCAP specification is based upon or is compatible with MHP (Multimedia Home Platform), a proven open middleware system.

OCAP plays a key role in broader OpenCable initiatives involving cable, consumer electronics and other industries. Their efforts are designed to encourage the development of high-definition TV sets and other digital devices that are "interoperable" with cable systems.

In turn, OpenCable will foster retail sales of cable set-top boxes (or TVs with set-top functionality built in), which is a mandate under federal law.

If all devices use OCAP, they'll play together better with the applications that run on them, and with each other, and with cable systems. The involved companies will be happy with the result. And consumers will be the happiest of all.

- Written by Craig Leddy and Leslie Ellis



OCAP Solutions



Make the most of OCAP with NDS end-to-end solution:

- > Fully compliant with industry-standard solutions
- > The most advanced user-driven, customer-requested features
- > A proven solution from a proven supplier
- > Able to successfully integrate and deliver with complex platforms

Contact

Email: OCAP@nds.com

ETV and OCAP

Enhanced TV provides an early entry path for interactive content applications

An acronym that travels nearly in lockstep with OCAP is "ETV," which stands for "Enhanced Television." Simply put, ETV is a cable-specific means for providing interactive services on the currently deployed base of digital set-top boxes.

CableLabs issued ETV specifications primarily to enable set-top boxes and devices with less memory and processing resources than the more advanced boxes that are slated to use OCAP. ETV provides an early entry point for applications including interactive advertising, play-along game shows, news, sports, polling, customer service upgrades and shopping.

Because ETV is designed to run on nearly all fielded digital boxes, it is necessarily "thinner" in size. It primarily focuses on "bound" applications, meaning interactivity triggers that pop up from within the show you're watching. That also means consumers can use them with existing buttons on their cable remotes.

A Technique Called EBIF

Technically, ETV is different than OCAP because it doesn't rely on the Java coding platform. Instead, it uses a technique called "EBIF," which stands for "enhanced binary interchange format." Tech people tend to call it "ee-biff" for short. Either way, it's a mouthful.

How EBIF works is beyond the scope of this document (blessedly!). The thing to remember is that EBIF is the mechanism that makes lightweight interactivity work within bound applications, on the deployed base of about 30 million digital boxes in the United States.

Technically speaking, ETV has three parts. First is a small chunk of software called a "user agent," which gets downloaded into the digital box. The job of the user agent is to watch for incoming ETV triggers. When the triggers appear, the user agent runs them.

The second part of the ETV spec involves signaling methods used to get the interactive triggers from their point of origination to the user agent.

The third part is a standard form for writing ETV applications, so that they can run on any box that's loaded up

with the user agent.

ETV In Practice

So, in practice, it works like this: A program network uses the ETV form to create an application. The triggers for that application get inserted into the digital TV bit stream (the "MPEG-2 transport stream," in tech lingo), using a thing called a "stream generator." Stream generators can be located at a content originator's facilities, or at a cable headend.

Meanwhile, the ETV-capable box gets loaded up with the user agent, and sits there, waiting and listening. When a trigger slips in through that digital bit stream, the user agent leaps into action to decode and display the clickable content on somebody's cable TV screen.

ETV, as an ongoing activity, is happening at CableLabs. Right now, it's at the "interop" stage, meaning that various participants regularly congregate in Louisville, Colorado, northwest of Denver, to make sure their parts of the ETV chain work with the other parts of the chain. CableLabs routinely hosts interops to keep ETV and OCAP activity moving forward.

If you attended the 2006 National Cable Show and visited the CableNET® area, you probably saw examples of ETV applications. The most discussed app, so far, is by Disney/ABC that ETV-enables its hit show, *Lost*. Mostly, the *Lost* app lets viewers catch up with characters, with quizzes and text-based background material.

Going From ETV to OCAP

Notably, because ETV is compatible with OCAP, any applications written for ETV will not require re-coding to run in an OCAP environment. A download of the core ETV "user agent" will be needed. But once that agent is in place, the applications run as intended.

To put this another way, all legacy boxes and OCAP devices will be capable of doing ETV applications, but not all legacy devices are capable of doing OCAP apps. Lately, the trend among cable operators is to emphasize ETV first, then OCAP. This makes sense, given the wider initial footprint for ETV.

OCAP enables more robust services and unbound interactive TV applications on devices that have more oomph. Yet ETV can be a good starting point for network programmers to create applications for today's digital set-tops and prepare for the ITV world.

- Written by Leslie Ellis



MOTO FOLLOW ME



Motorola can erase the barriers between places and services, and extend a providers' brand far beyond the physical walls of the home. Provider's can create new revenue opportunities by deploying next-generation technologies and fixed-mobile innovations.

So whether it's digital entertainment available from any nearby screen, voice-over-IP and mobile calling unified on one device, or personalized content delivered on-demand to any location, the Motorola experience connects your customers to home, even when they are far away.

To learn more about Motorola's OCAP Solution, please visit www.motorola.com/connectedhome, search for OCAP

Getting Ready for OCAP

Cable systems are preparing for OCAP—and they'll need content applications

Cable systems in select markets currently are going through the process of enabling their headends to deliver OCAP applications, starting this October.

While the involved cable operators are reporting a lot of progress in their OCAP missions, the process isn't simply a matter of throwing a switch and becoming an OCAP cable system. Nearly every step of the cable distribution process must be addressed, from headend to set-top box.

The Key Ingredients

Representatives of Time Warner Cable and Charter Communications recently outlined the key steps they're taking, during the Society of Cable Telecommunications Engineers Cable-Tec Expo.

The key ingredients in the OCAP recipe include the following:

- an "OCAP host," which is the box or the TV that works with a specific, OCAP-compliant remote control
- separable security—meaning CableCARD slots on leased boxes—because of an FCC-mandated deadline of July 2007 by which cable operators may no longer deploy boxes that have embedded security
- OCAP middleware, which may or may not come from the guy who builds the host device (In today's box world, the guy who provides the box is usually the same guy who provides the primary software for it.)
- a "monitor application," whose job it is to handle resource contention between, say, the software demands of a CE device and the software demands of the cable box, when they both have similar demands for support—usually memory or processing oomph
- an "object carousel," which moves applications and data across the network and is configured and managed differently in OCAP than in legacy environments
- and a type of signaling called "XAIT," which stands for "extended application information table," to initiate and manage the lifecycle of an OCAP application.

So, getting ready for OCAP isn't exactly a no-brainer, say its heavy-lifters, as they get ready for rollouts.

The good news is that triumphs already exist. "It was very exciting to see it come together, live, in the field—to see an application come in, get decrypted, get displayed, and

just work, with no strings attached," said Sherisse Hawkins, senior director of set-top development for Time Warner Cable's Advanced Technology Group, of their 2005 field tests.

So You Want to Write an OCAP App?

In order to deliver OCAP interactive content, another key ingredient is having interactive applications to deliver.

Applications can come from many sources. Cable companies may create their own applications in order to, say, enable customers to upgrade their cable services through their TV. Local systems can add local interactive news and weather. Programming networks can add interactive elements to any number of TV shows or advertisements.

TV manufacturers could add their own interactive features using OCAP, while any type of software company, broadband content provider or videogame provider could add interactive content to television's mix.

The first thing to determine is the type of application: a "bound application" (tied to a specific TV program, like a play-along game show) or an "unbound" app (maybe a weather app that's not tied to a specific channel, or maybe it's an addressable ad, a one-click purchase, or an informational overlay like sports statistics).

OCAP is based upon Sun Microsystem's Java technology, and it defines a set of Java-based APIs (application program interfaces), which, loosely put, help an application to manipulate the underlying device.

So, OCAP apps necessarily must be built using Java. Then, the application and any data files it accesses are bundled into an "object carousel" format. This is necessary to get the application to the boxes sitting at the other end of the cable wire.

A table also gets sent for bounds apps, called an "application information table," to tell the box there's an application coming, and where it is.

Inside the house, the box (or box within the TV) tunes the stream that contains your application. The OCAP software inside the box reads the AIT table, and launches your app.

It's not entirely that simple, but generally that's the anatomy of an OCAP app. And fortunately for content developers, a large number of software developers' kits have been developed to support apps from conception to delivery.

- Written by Leslie Ellis

The Value Proposition: Something for Everyone

All players in the television field can benefit from the unified development environment that OCAP provides



OCAP is designed to establish a common platform for interactive services that can enable companies to capitalize on new opportunities, expand existing business models, and extend existing product lines. Here is how various players can benefit.

CONTENT DEVELOPERS

It starts with an idea, a creative thought that becomes the basis for television content, whether a TV show, music video or live event. Using OCAP authoring tools, developers can add interactive elements to their artistic creations. They can give viewers the power to see an alternative ending to a whodunit, instantly access an actor's bio, or play along with a game show. Best of all, their interactive creations can run across multiple OCAP devices: Write once, run everywhere.

COPYRIGHT HOLDERS

Hollywood studios and other owners of copyrighted content can add value to their holdings by using OCAP interactivity to enhance their relationship with viewers—and even generate direct revenue. Movie buffs can get bonus material on-demand, sports junkies can access interactive statistics, and music fans can find their favorite singers' videos. All of which provides the opportunity to market on-demand fare and sell merchandise for movies, sports, games and music interactively through the TV.

TV NETWORKS

As network programmers search for new ways to build ratings, brands and ad revenues, OCAP interactivity can keep viewers engaged. A nationwide platform for interactive TV would justify the introduction of interactive TV advertising, a potentially huge revenue source. Digital interactivity provides for accurate ratings measurements. Interactive program guides and new navigation tools will help viewers to easily locate networks, shows, on-demand programs, actors or other favorites.

ADVERTISERS

The advertising community can finally see the long-await-

ed promise of interactive TV advertising come to fruition on a broad basis. Creative agencies can use OCAP tools that allow viewers to easily interact with commercials—get more information about a car, access an extended bonus clip, win a trivia contest. Advertisers can provide targeted messages through specific OCAP interactive applications or devices, or run their messages across multiple platforms to fully extend their audience reach.

CABLE COMPANIES

It's finally arriving. The widespread introduction of interactive TV, long constrained by inconsistent standards, incompatible platforms and expensive solutions, is within reach. OCAP provides a comprehensive system to launch interactive applications in a scalable and affordable way, whether on leased set-top boxes or through TVs and other devices sold at retail. And as MSOs market more bundled services, OCAP can serve as a convergence tool to support interactive content across video, voice and data platforms.

DEVICE MAKERS & RETAILERS

Want an interactive game on your TV, portable player and mobile phone? Not only can OCAP applications run on a specific OCAP-enabled device, like a set-top box or HDTV set, but they also could run on multiple devices, providing a capability that is "whole home"—or even beyond the home. As the cable and consumer electronics industries work to support interoperability between digital delivery and device platforms, OCAP will be a key to spreading interactivity to consumers—anytime, anywhere.

CONSUMERS

The biggest winners of all. Consumers will enjoy a wealth of TV program innovations, convenient navigation features, viewing enhancements and services such as interactive news, sports, weather, entertainment, information, games, music, polling, advertising and shopping. OCAP can be the glue to help bond activities across different gadgets: get email on your TV, store a music video on your portable player, or use your cell phone to remotely program your DVR. OCAP enables the next generation of TV.

- Written by Craig Leddy

What OCAP Enables

OCAP promises to unleash interactive creativity on multiple devices—here's how

The technical specifications are set, the software and tools are available, and OCAP is getting the attention of cable MSOs, consumer electronics companies and applications developers. But what can you really do with OCAP?

OCAP promises to have a major impact in two key areas, which are best categorized as interactive TV and convergence. Those are buzzwords that have been used, overused, and misused, so it's important to put them into the context of what they represent today.

New Interactive Apps

In the interactive TV arena, OCAP middleware and authoring tools can be used to create and deploy lots of new applications and features that appear on the TV screen. With a click of their TV remote, viewers could access interactive entertainment, information or viewing features included in a particular program, a network or an application provided by a cable company.

The potential apps include interactive program guides, games, shopping, music, news, weather, local information, sports, advertising, polling, banking and other services. The OCAP platform also supports e-mail and chat on TV and is technically compatible with IP telephone.

Applications can either be bound (tied to the currently tuned program), unbound (free to run anywhere) or native (run on a particular device). It also should be noted that OCAP supports or conforms to prerequisites such as program content advisories, parental controls, emergency alerts, security and conditional access systems.

Emergence of Convergence

OCAP supports the convergence of multiple content platforms—and here's where things get really interesting. As OCAP middleware is put into different types of digital devices, OCAP interactivity can spread to those devices as well. So it fosters interoperability, or the ability of interactive content to work on various devices.

The first devices to include "OCAP inside" will be high-end digital cable set-top boxes and consumer electronics devices like HDTV sets, the first of which are starting to emerge from major manufacturers. Digital video recorders (DVRs), game players, portable video devices, wireless gadgets and personal computers with OCAP can be part of the mix.

Consumer electronics makers must get license certification

for this new line of TVs. The license goes by the name—excuse the technical jargon—of CHILA, pronounced "cheye-luh," rhymes with "lila." It stands for "CableCARD Host Interface Licensing Agreement."

Companies that sign the CHILA agreement, through CableLabs, agree to build devices that can be tested and certified to run approved, two-way applications across the cable plant. Part of the agreement is a stipulation that OCAP will be included. CHILA signatories include Digeo, LG Electronics, Panasonic, Samsung and Thomson.



The OCAP-enabled MPTV application from itaas lets a TV viewer buy music or a video and send it to a mobile phone or email address, an example of interactivity and convergence.

CableCARDs and Host Devices

Another important element in spurring interoperability is the so-called "plug-and-play" agreement between cable and consumer electronics companies that ensures that consumers who purchase a new digital or HDTV set can get one-way ("unidirectional") cable signals, without a set-top box, by slipping a CableCARD into the device.

One of the terms that pops up in discussions about "OCAP devices" is the "host device." A "host device" is any piece of hardware that touches and interacts with the cable plant. A digital TV with a CableCARD slot is a host device, for example.

At this writing, cable, consumer electronics and other industry negotiators are seeking uniform guidelines on two-way ("bi-directional") delivery, so that interactive services work seamlessly over cable and connected devices (based upon requisite security, licensing and business arrangements, of course).

The National Cable & Telecommunications Association and Consumer Electronics Association already have agreed to incorporate support for OCAP in iDCR devices. The associations also are working to promote a new

downloadable security system for content protection.

The Java Virtual Machine (JVM)

Most of the OCAP specification is rooted in a parallel effort in Europe, known as DVB-MHP (Digital Video Broadcast-Multimedia Home Platform.)

A very big part of the DVB-MHP effort is the “Java Virtual Machine,” or JVM. It is a key ingredient in the anatomy of an OCAP application.

The “Java” in JVM tags the technology as an invention of Sun Microsystems. In short, the JVM is a combination of an interpreter—the stuff that reads the code—and the Java language, or the code itself. Newer Palm Pilots, high-end cell phones, and other electronic gadgets already use JVM.

With JVM as the “engine” within OCAP, and with a large and growing base of software programmers who know how to write in the Java language, a path is created to write or re-write existing set-top applications in a common language.

Plus, all Java-based technologies are community-governed, which makes them more “open” than other more proprietary options.

When all of the key elements come together—including the correct amount of memory, processing power and the JVM—it creates a recipe to cook up all types of new OCAP interactive applications and serve them on a lot of different plates.

Software Developers Kits

To help the development process, a spate of “software developers’ kits,” or SDKs, has begun to emerge from the vendor community, to assist the content and creative community in writing OCAP-based applications.

SDKs are manna, because they assist in “abstracting away” the differences that characterize today’s fielded digital boxes and forthcoming ones. For a creative developer, focus can return to what the clickable thing should look like, where it should go on the screen, and what should happen after somebody engages it.

A partial list of providers of OCAP tools includes GoldPocket Interactive (purchased by Tandberg TV), eMuse Technologies, NDS, enSequence, Osmosys, and Vidiom. They provide a mixture of software gear, ranging from “drag and drop”-based authoring tools, to full software development kits and integrated test environments.

That’s good news for creative types and code writers. As OCAP gains deployment momentum, the authoring situation will ease for creative developers. It’s one of the primary reasons for OCAP: The “write once, run everywhere” scenario.

- Written by Leslie Ellis and Craig Leddy

What’s Next

Cable and consumer electronics companies are taking steps to make OCAP a reality, beginning this fall.

Most of the major cable providers promised the Federal Communications Commission a handful of OCAP-enabled systems by this October, followed by a full roll-out to all systems over the next two years.

There are many reasons for cable to embrace a world of interoperable devices that use OCAP software; fostering a retail environment for cable devices is required by law. Yet a primary impetus is that interactivity makes business sense.

“OCAP is critical. We have to go as fast as possible,” said Brian Roberts, chairman and CEO of Comcast, during a CableLabs event in May. OCAP provides bedrock software for Comcast and other MSOs, he said.

Time Warner Cable is targeting OCAP launches in five markets by year’s end, said Glenn Britt, chairman and CEO. Initial applications include an OCAP-created version of a program guide, which Britt admits is “boring right now...But it opens up the ability to write things a lot easier.”

During the recent Society of Cable Telecommunications Engineers Cable-Tec Expo, Time Warner and Charter Communications outlined their steps to prepare their headends for OCAP delivery.

Set-top box makers, including Motorola and Scientific Atlanta, a Cisco Company, are offering OCAP products while consumer electronics companies, including LG Electronics, Panasonic, and Samsung, are preparing OCAP-enabled TV sets for rollout.

As MSOs gear up for deployments based upon the OCAP 1.0 specifications, CableLabs is gearing up a 1.1 supplement. Among the many features that it will address are Internet protocol television (IPTV), targeted digital advertising and cross-platform applications.

CableLabs already has issued “extensions” to the application program interfaces (APIs) that extend OCAP capabilities for DVRs and home networking. Addressable advertising, through digital program insertion (DPI), is a planned new feature for the 1.1 version of OCAP. Links to the specs are available through the CableLabs and OCAP Primer web sites.

These and other activities are building momentum for much more OCAP activity in 2007 and beyond. For the future of cable interactivity, the sky’s the limit.

Watch for updates in The OCAP Primer web site, www.ctam.com/ocap



The World is Changing Before Our Eyes

Television is no longer just plain old TV.

It's interactive, on-demand, high-definition, broadband, downloadable and mobile.

As television changes, all players in the TV industry must change with it.

What are the right content applications, technologies, marketing strategies and business models that will lead to success?

Interactive TV Works supports successful deployment of advanced digital services through a variety of writing, research, consulting, marketing, and training services.

Led by cable and digital media expert Craig Leddy, we've helped major companies to realize their full potential in this challenging and highly competitive digital environment.

We'll show you how Interactive TV *Works*.
Contact Craig Leddy, cleddy@interactivetvworks.com

Interactive TV *Works*

www.interactivetvworks.com