

# Media Bureau Mtg 11/02/'06

1. Technical walk through.
2. Discussion.

# Summary

- Enables equivalent interactive functionality at a competitive cost structure
- Requires only minimal changes to CableCARD and Host
  - Requires no changes to the cable network
- Unlocks inherent bi-directional capability of current CableCards, using existing standards
- Achievable in the near term
- Easily achievable with minimal licensing and regulatory changes

# Enable Consumer Choice



Cable Plant

Proprietary & Non-uniform  
Information Format

MSO-Leased  
Navigation Device  
(Seeking Waiver)



Equivalence in Service Access

Proprietary & Non-uniform  
Information Format

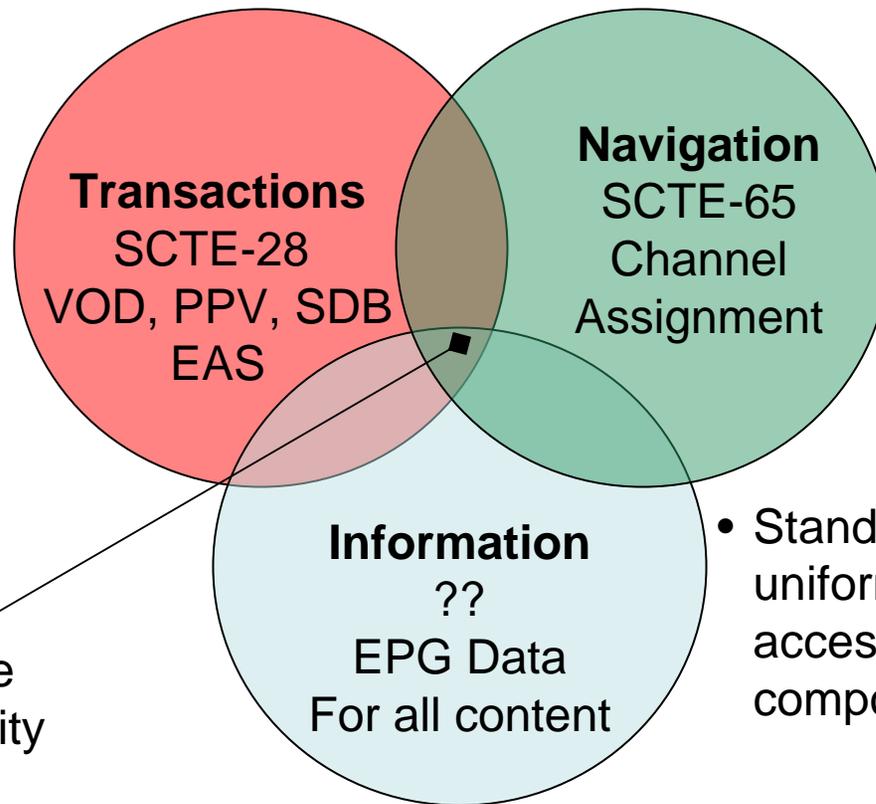


Standardized Protocol:  
SCTE-28 & SCTE-65,  
Per FCC Part 76

Sec 629  
Retail Navigation Device



# Cable Service Access

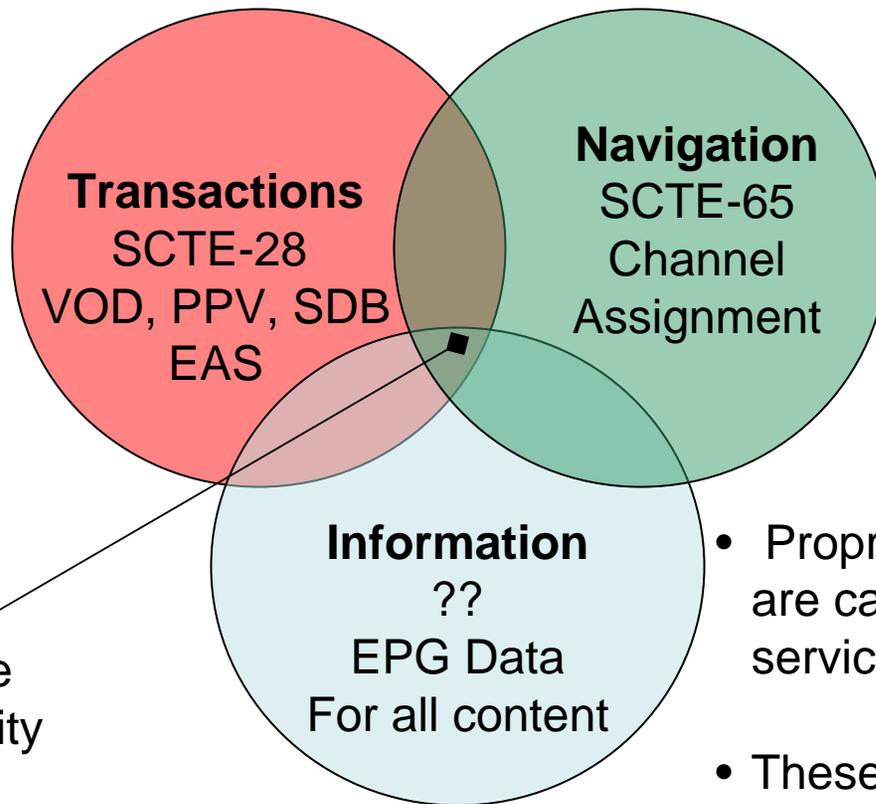


Leased Device  
Access Capability

- Standards codified in 76.402 created uniform methods for retail devices to access a very limited set of service components on cable networks

# Cable Service Access

## Today's UDCR

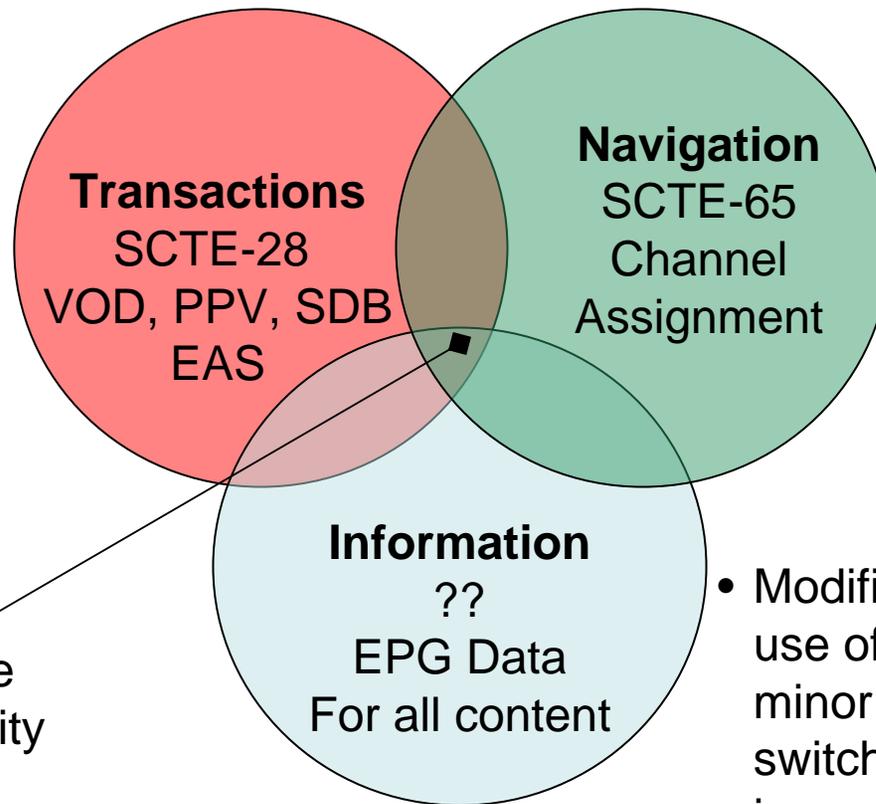


Leased Device  
Access Capability

- Proprietary MSO-leased devices are capable of accessing 3 key service components
- These component determine the scope of programming that can be accessed by the device

# Cable Service Access

## All Devices Access Capability: Retail & Leased

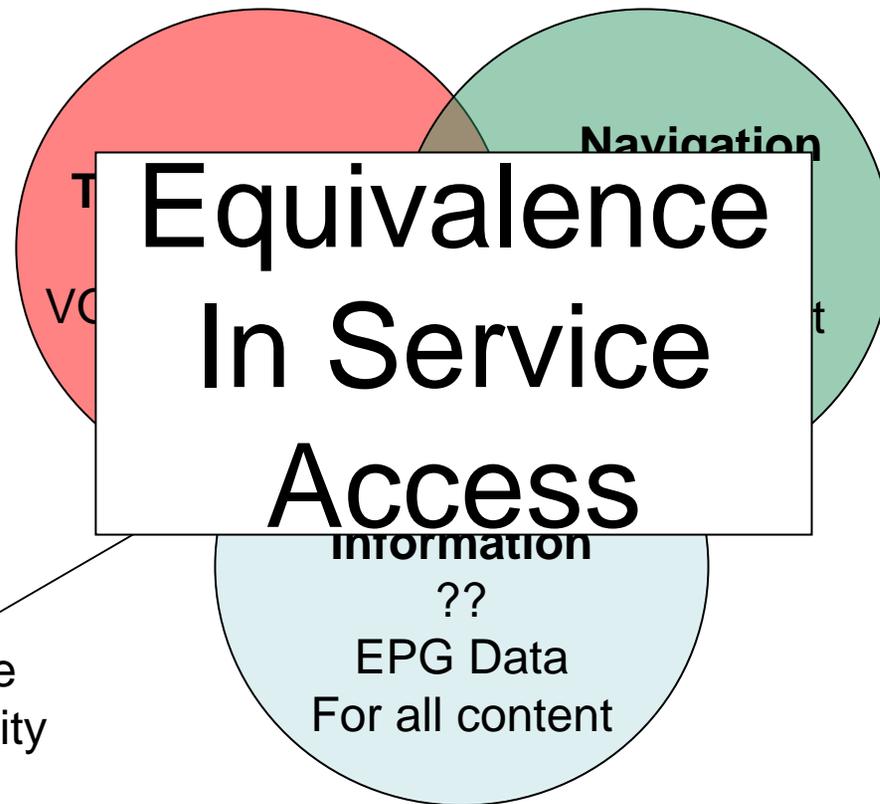


Leased Device  
Access Capability

- Modification of regulation to allow full use of the existing standards, plus minor extensions to accommodate switched digital allow equivalence in service access for all devices

# Cable Service Access

All Devices Access Capability: Retail & Leased



Leased Device  
Access Capability

# Spec Extensions

	linear	IPPV	VOD	Switched Digital
Information SCTE 65	✓	✓	Δ	Δ
Transaction SCTE 28	✓	✓	✓	Δ
Trick Play DSMCC	NA	NA	Δ	NA

# 9/10/2003 FCC 2<sup>nd</sup> R&O

## Established Standards for Access to Digital Cable Services by Retail Devices

Federal Communications Commission		FCC 03-225
Before the Federal Communications Commission Washington, D.C. 20554		
In the Matter of	)	
Implementation of Section 304 of the Telecommunications Act of 1996	)	CS Docket No. 97-80
Commercial Availability of Navigation Devices	)	
Compatibility Between Cable Systems and Consumer Electronics Equipment	)	PP Docket No. 00-67
SECOND REPORT AND ORDER AND SECOND FURTHER NOTICE OF PROPOSED RULEMAKING		
Adopted: September 10, 2003		Released: October 9, 2003
Comment Date: January 14, 2004		
Reply Comment Date: February 13, 2004		
By the Commission: Chairman Powell, Commissioners Abernathy, Copps, Martin, and Adelstein issuing separate statements.		
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Add §76.640 to subpart B to read as follows:

### §76.640 Support for Unidirectional Digital Cable Products on Digital Cable Systems.

(1) Digital cable systems with an activated channel capacity of 750 MHz or greater shall comply with the following technical standards and requirements:

(ii) ANSI/SCTE 65 2002 (formerly DVS 234): "Service Information Delivered Out-of-Band for Digital Cable Television" (incorporated by reference, see § 76.602), provided however that the referenced Source Name Subtable shall be provided for Profiles 1, 2, and 3.

(2) All digital cable systems shall comply with:

(i) SCTE 28 2003 (formerly DVS 295): "Host-POD Interface Standard" (incorporated by reference, see § 76.602).

# SCTE 28 (2003)

## Transactional Protocol



ENGINEERING COMMITTEE  
Digital Video Subcommittee

AMERICAN NATIONAL STANDARD

ANSI/SCTE 28 2003  
(Formerly DVS 295)

HOST-POD Interface Standard

Syntax	# of bits	Mnemonic
program_req() {		
program_req_tag	24	uimsbf
length_field()		
transaction_id	8	uimsbf
transport_stream_id	16	uimsbf
program_number	16	uimsbf
source_id	16	uimsbf
event_id	16	uimsbf
current_next indicator	8	uimsbf
reserved	7	
current_next	1	uimsbf
program_info_length	8	
for (i=0; i < program_info_length; i++) {		
ca_descriptor()		
/* ca descriptor at program level! */		
}		
}		

Syntax	# of bits	Mnemonic
Program_cnf() {		
Program_cnf_tag	24	Uimsbf
Length_field()		
Transaction_ID	8	Uimsbf
Status_field	8	Uimsbf
If (Status_field == 0) {		
Option_nb	8	Uimsbf
For (Option_ID=1; I <= Option_nb;		
Option_ID++) {		
Purchase_type	8	Uimsbf
Purchase_price	16	Uimsbf
Purchase_validation	8	Uimsbf
Expiration_date	32	Uimsbf
Program_start_time	32	Uimsbf
Initial_Free_preview_duration	16	Uimsbf
Anytime_free_preview_duration	16	Uimsbf
Title_length	8	Uimsbf
for (J=0; J < Title_length; J++) {		
Title_txt	8	Uimsbf
}		
Text_length	8	Uimsbf
for (J=0; J < Text_length; J++) {		
Text_txt	8	Uimsbf
}		
Descriptor_length	16	Uimsbf
for (K=0; K < Desc_length; K++) {		
Descriptor()		Uimsbf
}		
}		
}	var	
}		

# SCTE 65 (2002)

## Navigation Protocol

Table 5.17 Virtual channel record format

	Bits	Bytes	Format
virtual_channel(){			
zero	4	2	bslbf
virtual_channel_number	12		uimbsf range 0-4095
application_virtual_channel	1	1	bslbf (no, yes)
zero	1		bslbf
path_select	1		bslbf see Table 5.18
transport_type	1		bslbf see Table 5.19
channel_type	4		uimbsf see Table 5.20
if (application_virtual_channel) {			
application_ID	16	(2)	
} else {			
source_ID	16	(2)	
}			
if (transport_type==MPEG_2) {			
CDS_reference	8	((1))	uimbsf range 1-255
program_number	16	((2))	
MMS_reference	8	((1))	uimbsf range 1-255
} else { /* non-MPEG-2 */			
CDS_reference	8	((1))	uimbsf range 0-255
scrambled	1	((1))	bslbf (no, yes)
zero	3		bslbf
video_standard	4		uimbsf see Table 5.21
zero	16	((2))	bslbf
}			
if (descriptors_included) {			
descriptors_count	8	(1)	uimbsf
for (i=0; i<descriptors_count; i++){			
descriptor()	*	((*))	
}			
}			
}			

Table 5.20 Channel Type

channel_type	meaning
0	<b>normal</b> — Indicates that the record is a regular virtual channel record. For non-MPEG-2 channels, the waveform_type shall be defined as “normal.”
1	<b>hidden</b> — Indicates that the record identifies a virtual channel that may not be accessed by the user by direct entry of the channel number (hidden). Hidden channels are skipped when the user is channel surfing, and appear as if undefined if accessed by direct channel entry. Programs constructed for use by specific applications (such as NVOD theaters) utilize hidden virtual channels. If a channel_properties_descriptor() is present and the hide_guide bit is 0, the channel may be considered to be <i>inactive</i> . Inactive channels may appear in EPG displays.
2-15	<b>reserved</b> — Hosts are expected to treat virtual channel records of unknown channel_type the same as non-existent (undefined) channels.



Society of Cable  
Telecommunications  
Engineers

ENGINEERING COMMITTEE  
Digital Video Subcommittee

SCTE 65 2002  
(formerly DVS 234)

SERVICE INFORMATION  
DELIVERED OUT-OF-BAND FOR  
DIGITAL CABLE TELEVISION

# ISO/IEC 13818-6 (1998) DSMCC

## VOD Trick Play Protocol



### 0. Introduction

The Digital Storage Media Command and Control (DSM-CC) specification is an integral part of ISO/IEC 13818 (MPEG-2). It consists of a modular set of protocols that may be combined or used individually to provide a wide range of functionality which may be used to support emerging multimedia technologies.

The concepts and protocols of DSM-CC provide the general capability to browse, select, download, and control a variety of bit stream types. DSM-CC also provides a mechanism to manage network and application resources through the concept of a "session". A Session is an associated collection of resources required to deliver a Service. Examples of resources are MPEG-2 Transport Stream packet identifiers and network bandwidth. The Session complements a "Service Domain", which is a collection of interfaces to browse and select services, and control the delivery of bit streams.

One of the strengths of DSM-CC is in its abstraction from underlying networks; a suite of uniform interfaces are visible to the application, shielding it from the details of inter-working among heterogeneous networks — e.g., Hybrid Fiber Coax (HFC), Asynchronous Transfer Mode (ATM), Asymmetric Digital Subscriber Loop (ADSL), Internet Protocol (IP), and combinations of these technologies as part of an end-to-end multimedia system. In other words, a server may simultaneously and uniformly interact through a single network interface with clients connected to different network types, without requiring a separate network interface to each client.

The session signaling layer provides a uniform, flexible, and extensible method for managing heterogeneous resource types. In addition to the network and service types described in this specification, DSM-CC may be extended to support other networks and services through the definition of new resource types.

In DSM-CC, a bit stream is sourced by a Server and delivered to a Client. Both the Client and the Server are logical embodiments and do not imply a singular device in an actual implementation.

Application/service examples are interactive multimedia retrieval (including video-on-demand), Internet access, digital video broadcasting, data downloading, and audio/video/graphics conferencing.

# ISO/IEC 13818-6: MPEG-DSMCC Extension

## 5.5.1.3 Stream

Stream primitives are used to emulate VCR-like controls for manipulating MPEG continuous media streams.

The following primitives are specified for stream mode objects:

DSM Stream pause (rStop)	Cause the video server to stop sending a stream when it reaches rStop (in Normal Play Time, NPT).
DSM Stream resume (rStart, rScale)	Cause the video server to resume sending the stream at rStart (NPT) at a rate and direction specified by rScale (1/1, 1/2, -1/2, etc.)
DSM Stream status (rAppStatus, rActStatus)	Used to request status of a stream in progress. Returns the current AppNPT position (NPT), scale and mode (pause, transport, stop, ...) of the stream.
DSM Stream reset ()	Used to reset the Stream state machine to the initial state.
DSM Stream jump (rStart, rStop, rScale)	When stream reaches rStop (NPT), jump to rStart (NPT) and play at a rate and direction specified by rScale.
DSM Stream play (rStart, rStop, rScale)	Plays stream from rStart (NPT) until rStop (NPT) at a rate and direction specified by rScale.

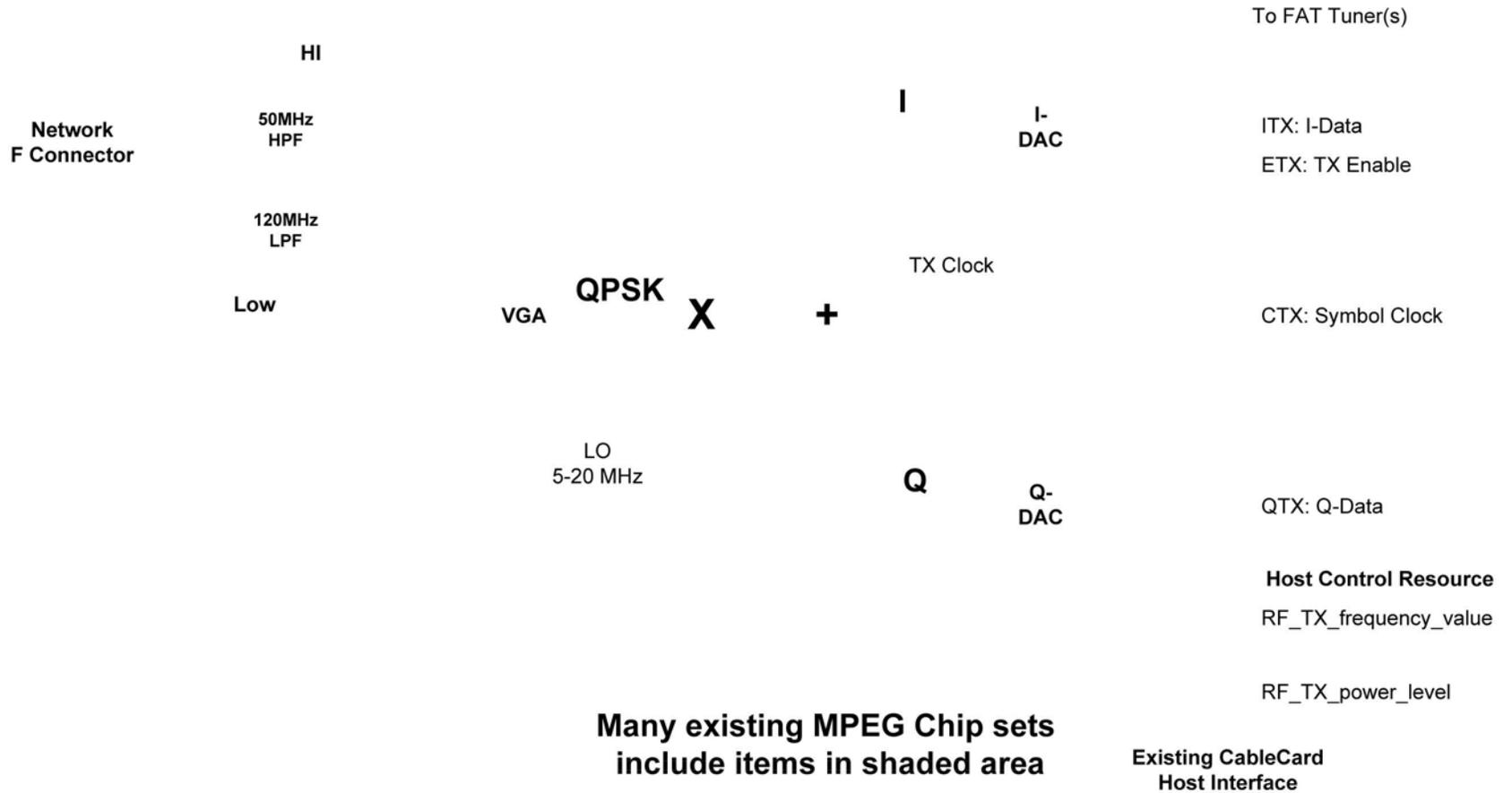
# Bidirectional Service Identification

- Virtual Channel Map contains list of network assets
  - Each virtual channel entry in VCM contains a channel\_type field
    - channel\_types 0 & 1 already defined
    - channel\_types 2-15 reserved
    - Currently, only type 0 may be accessed by UDCR
  - Define channel\_type 2 as a switched service
  - Define channel\_type 3 as a VOD service
  - If desired service is type 2 or 3, DCR+ can access, UDCR cannot
- } SCTE 65 Mod
- Inaccessible channels can be culled from displayed map & tuning table, improving user experience

# BiDirectional Service Navigation

- Use existing SCTE-28 protocol for PPV through ***Program\_Req()*** syntax
- Card queries HE using systems's proprietary protocol to have service allocated
  - If request granted, VCT updated with current data and program\_cnf returned ⇒ SCTE28 Mod.
    - Status field contains request grant (0x00) or deny (0x02)
    - Purchase type field will indicate
      - SBD as 'subscription' or 'viewing' service (0x00-0x03)
        - » No financial transaction required
      - VOD & IPPV as 'purchased' service (0x04-0x06)
    - DCR+ device then tunes using current VCT data
    - Denied access can be detected and OSD generated

# Return Path



# Information

- Solution should allow Consumers device to:
  - Browse available content (current/future)
  - Locate desired content (for view/record)
- Comparable to leased STB's

# Example Program Information

- Program title & duration
- Synopsis/description
- Genre
- Languages of all spoken & textual components
- Actors, director, writers, etc.
- Critics reviews
- Video attributes (resolution, aspect ratio, bit rate, coding, frame rate)
- Audio attributes (no. channels, coding, etc.)
- Content advisories
- Available captioning/subtitles
- Repeat, live broadcast, first-run, etc.
- First-aired date

# Product Features Supportable

- Full-featured EPG with program schedule, titles, descriptions
- Browse by genre
- Search by actors, directors, etc.
- Record once, first-run only, all episodes, etc.
- Automated suggestions
- Features equivalent to or exceeding current available DVR products

# Requested Actions:

- Modification of part 76 & DFAST L.A.
  - Allow access by retail devices to BiDi services
  - Use CC APIs, with extensions, to access all services: Linear, SDB, PPV & VOD
  - Require implementation of enhanced capability in all CCs available after 12/07
- Require the industries to jointly adopt/establish a common standard for guide data delivery via CC interface & implement on all CCs available after 12/08
- Require full disclosure of cable's DCAS proposal for review and comment in an open forum
- Require that any successor to current the CC:
  - Conform to the existing CC APIs for navigation & transactions
  - Conform to existing CC independence from host platform applications, OS, middleware, etc.
  - As with current CC, include provisions in design and implementation for field replacement at no cost to subscriber in the event that it ever becomes compromised

# Spec Extensions

	linear	IPPV	VOD	Switched Digital
Information SCTE 65	✓	✓	Δ	Δ
Transaction SCTE 28	✓	✓	✓	Δ
Trick Play DSMCC	NA	NA	Δ	NA

# Summary

- Offer competitive solution to Leased STB that can access the same services
- Legacy and Retail indistinguishable to existing infrastructure.
- Rely on the same standards/protocols used by the legacy systems
- Works across all networks (does not disadvantage consumers in low density/limited channel capacity networks)
- Does not require significant changes to existing infrastructure.
- Could be equally applied to future Software Implementations