



Data Casting

Using ATSC 1.0 and/or

ATSC3.0

Broadcast

UniSoft Corporation

May 12, 2023

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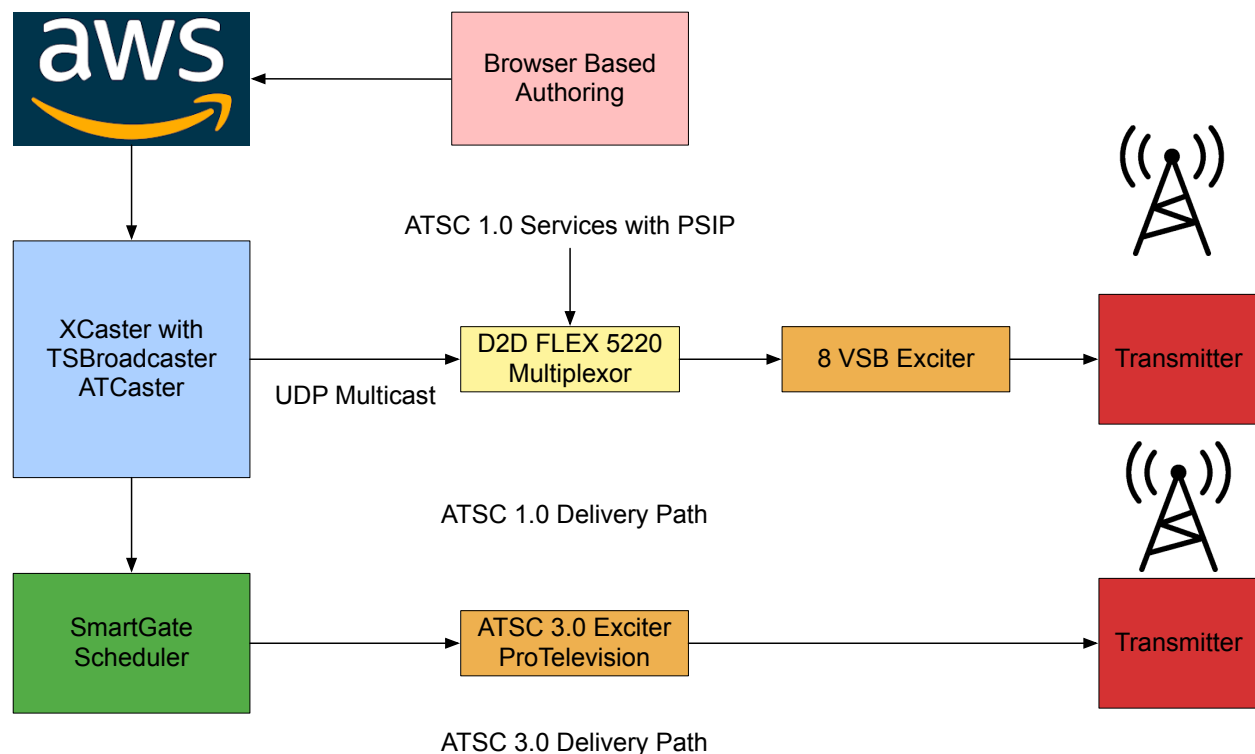
1. Overview

UniSoft offers the XCaster datacasting system which can deliver content either via ATSC 1.0 or 3.0. Transmission to each standard may occur either simultaneously or individually.

In addition, UniSoft Corporation offers a variety of ATSC 3.0 delivery components, software and integration services.

1.1. XCaster Configuration Summary

The diagram below shows a typical XCaster configuration, with dual delivery paths:

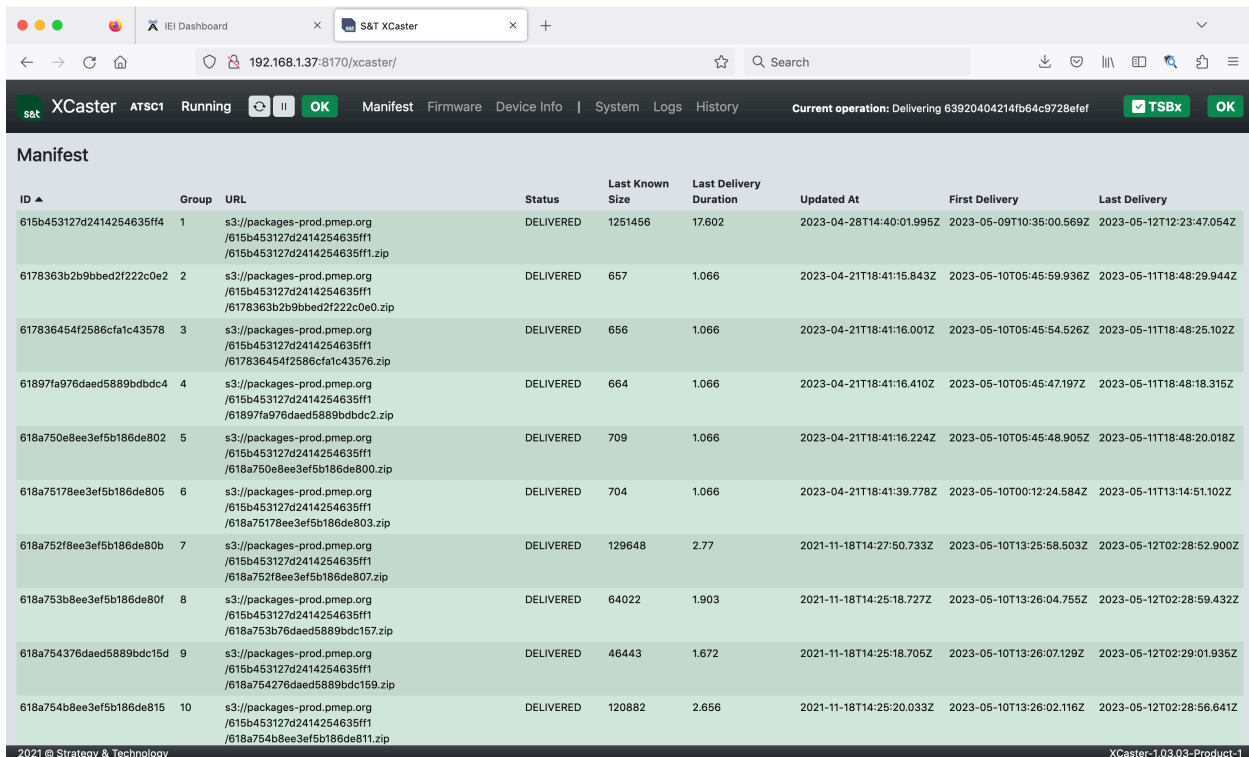


2. XCaster

XCaster is bundled with two software packages TSBroadcaster and ATCaster. TSBroadcaster encodes data into a DSM-CC data carousel for transmission over ATSC 1.0. ATCaster delivers data via a NRT within a 3.0 broadcast.

XCaster is particularly suitable for transmission of educational material for remote learning applications. There are countless other applications too including digital signage ads, data to medical kiosks, emergency alerts or even firmware upgrades for a variety of mobile devices.

XCaster can also deliver standalone web sites to locations which do not have a broadband connection.

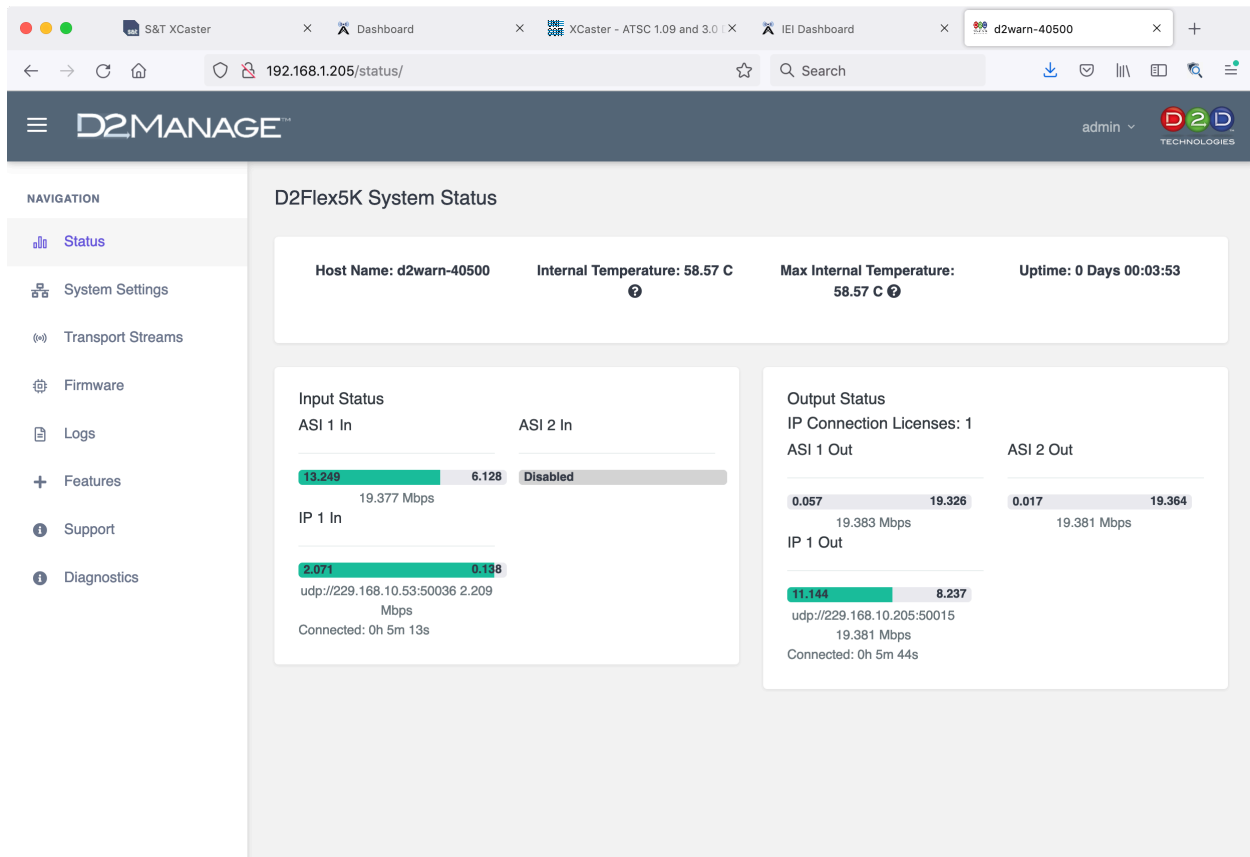


The screenshot shows the S&T XCaster web interface. The browser address bar displays '192.168.1.37:8170/xcaster/'. The interface includes a navigation bar with tabs for 'Manifest', 'Firmware', 'Device Info', 'System', 'Logs', and 'History'. The 'Manifest' tab is active, showing a table of data. The table has columns for ID, Group, URL, Status, Last Known Size, Last Delivery Duration, Updated At, First Delivery, and Last Delivery. The table contains 10 rows of data, all with a status of 'DELIVERED'. The footer of the interface shows '2021 © Strategy & Technology' and 'XCaster-1.03.03-Product-1'.

ID	Group	URL	Status	Last Known Size	Last Delivery Duration	Updated At	First Delivery	Last Delivery
615b453127d2414254635ff4	1	s3://packages-prod.pmpc.org/615b453127d2414254635ff1/615b453127d2414254635ff1.zip	DELIVERED	1251456	17.602	2023-04-28T14:40:01.995Z	2023-05-09T10:35:00.569Z	2023-05-12T12:23:47.054Z
6178363b2b9bbd2f222c0e2	2	s3://packages-prod.pmpc.org/615b453127d2414254635ff1/6178363b2b9bbd2f222c0e0.zip	DELIVERED	657	1.066	2023-04-21T18:41:15.843Z	2023-05-10T05:45:59.936Z	2023-05-11T18:48:29.944Z
617836454f2586cfa1c43578	3	s3://packages-prod.pmpc.org/615b453127d2414254635ff1/617836454f2586cfa1c43576.zip	DELIVERED	656	1.066	2023-04-21T18:41:16.001Z	2023-05-10T05:45:54.526Z	2023-05-11T18:48:25.102Z
61897fa976daed5889bdbc4	4	s3://packages-prod.pmpc.org/615b453127d2414254635ff1/61897fa976daed5889bdbc2.zip	DELIVERED	664	1.066	2023-04-21T18:41:16.410Z	2023-05-10T05:45:47.197Z	2023-05-11T18:48:18.315Z
618a750e8ee3ef5b186de802	5	s3://packages-prod.pmpc.org/615b453127d2414254635ff1/618a750e8ee3ef5b186de800.zip	DELIVERED	709	1.066	2023-04-21T18:41:16.224Z	2023-05-10T05:45:48.905Z	2023-05-11T18:48:20.018Z
618a75178ee3ef5b186de805	6	s3://packages-prod.pmpc.org/615b453127d2414254635ff1/618a75178ee3ef5b186de803.zip	DELIVERED	704	1.066	2023-04-21T18:41:39.778Z	2023-05-10T00:12:24.584Z	2023-05-11T13:14:51.102Z
618a752f8ee3ef5b186de80b	7	s3://packages-prod.pmpc.org/615b453127d2414254635ff1/618a752f8ee3ef5b186de807.zip	DELIVERED	129648	2.77	2021-11-18T14:27:50.733Z	2023-05-10T13:25:58.503Z	2023-05-12T02:28:52.900Z
618a753b8ee3ef5b186de80f	8	s3://packages-prod.pmpc.org/615b453127d2414254635ff1/618a753b76daed5889bdc157.zip	DELIVERED	64022	1.903	2021-11-18T14:25:18.727Z	2023-05-10T13:26:04.755Z	2023-05-12T02:28:59.432Z
618a754376daed5889bdc15d	9	s3://packages-prod.pmpc.org/615b453127d2414254635ff1/618a754276daed5889bdc159.zip	DELIVERED	46443	1.672	2021-11-18T14:25:18.705Z	2023-05-10T13:26:07.129Z	2023-05-12T02:29:01.935Z
618a754b8ee3ef5b186de815	10	s3://packages-prod.pmpc.org/615b453127d2414254635ff1/618a754b8ee3ef5b186de811.zip	DELIVERED	120882	2.656	2021-11-18T14:25:20.033Z	2023-05-10T13:26:02.116Z	2023-05-12T02:28:56.641Z

3. D2D Multiplexor

The D2Flex5K device provides a cost effective method of adding a XCaster data service to your existing ATSC 1.0 services:



4. Creating Content

Content is created using a web based authoring environment which pushes the data to AWS.

The screenshot shows the UniSoft Datacasting Delivery System authoring interface. On the left is a sidebar with a menu containing: Topologies, Lessons, Devices, Galleries, Tutorials, Archives, and Resources. The 'Lessons' menu is expanded, showing a tree structure: USFT Class > Networking Basics > Vlan, PIM, Prune-Join Messages, Smart Licensing, Rendezvous Points, GRE Tunnels, IPV6 Addresses, Building DSG Tunnels on a Cisco uB, Mathematics and Gardening, Prime Numbers, and Digging fence post holes, the be. The main content area is titled 'USFT Class > Networking Ba...' and contains a 'DESCRIPTION' tab. It features a 'Banner Alt Text' field, a 'Short Description' field with the text 'Protocol Independent Multicast', and a 'Long Description' field with the text 'Protocol Independent Multicast'. Below these fields is a rich text editor with a toolbar showing options for Paragraph, Helvetica, 21px, Bold, Italic, Underline, Strikethrough, Superscript, Subscript, Text Color, and Background Color. The editor contains the text 'About PIM' followed by a paragraph: 'PIM, which is used between multicast-capable routers, advertises group membership across a routing domain by constructing multicast distribution trees. PIM builds shared distribution trees on which packets from multiple sources are forwarded, as well as source distribution trees on which packets from a single source are forwarded.' At the bottom of the editor, it says '313 WORDS POWERED BY TINY'. A notification bar at the bottom of the interface says 'Notification with no title' with 'List View' and 'Card View' buttons. The footer contains copyright information: '© Copyright 2022 Signal Infrastructure Group PBC. All rights reserved.', a 'Privacy Policy' link, and the version number 'Version: 2.2.9-2023-01-12.22:27-test'.

It is viewed via a web browser at the reception point:

The screenshot shows the UniSoft Datacasting Delivery System viewer interface in a web browser. The browser address bar shows the URL '192.168.30.99/eduApp/lesson.html'. The page title is 'Protocol Independent Multicast'. The main content area is titled 'About PIM' and contains the same text as the authoring interface: 'PIM, which is used between multicast-capable routers, advertises group membership across a routing domain by constructing multicast distribution trees. PIM builds shared distribution trees on which packets from multiple sources are forwarded, as well as source distribution trees on which packets from a single source are forwarded.' Below this text is a 'Note' section with a warning icon and the text: 'Cisco NX-OS does not support PIM dense mode. In Cisco NX-OS, multicast is enabled only after you enable the PIM feature on each router and then enable PIM sparse mode on each interface that you want to participate in multicast. You can configure PIM for an IPv4 network. In an IPv4 network, if you have not already enabled IGMP on the router, PIM enables it automatically. You use the PIM global configuration parameters to configure the range of multicast group addresses to be handled by these distribution modes: Any Source Multicast (ASM) provides discovery of multicast sources. It builds a shared tree between sources and receivers of a multicast group and supports switching over to a source tree when a new receiver is added to a group. ASM mode requires that you configure an RP. For more information about PIM sparse mode and shared distribution trees used by the ASM mode, see RFC 4601.' Below the text is a list of links: Hello Messages, Join-Prune Messages, State Refreshes, Rendezvous Points, PIM Register Messages, Designated Routers, ASM Switchover from Shared Tree to Source Tree, Administratively Scoped IP Multicast, PIM Graceful Restart, and High Availability. On the right side of the page is a sidebar with the following information: 'Your Teacher' (Guy Hadland, gvh@unisoft.com, +1 650 333 9927), 'USFT Class', 'Technical Support' (Hotline: Unisoft logo), and '©2022 IEI'. At the bottom of the page is a 'Back to Dashboard' button.

5. HDHomeRoom Receiver

The HDHomeRoom Receiver from SiliconDust includes a status page which allows users to set the channel for the data service.

Model Number	HDAT-128GB
Firmware Version	20210902
Serial Number	40000031

HDHomeRoom™ Status	
Operational Status	healthy
Tuner Channel	15
Tuner Lock	8vsb
Tuner Data	yes
Signal Strength	100%
Signal Quality	79%
Symbol Quality	100%
Manifest Rx	11867
Available Files	0/44
Total Space	125.8GB
Used Space	0.1GB
Free Space	125.7GB

HDHomeRoom™ Configuration	
<input type="text" value="15"/>	<input type="button" value="Set Channel"/>

6. UniSoft Classroom Gateway

The Classroom Gateway is more suitable for being shared by multiple students who can connect via WiFi. The configuration includes:

- Intel NUC PC running Ubuntu Linux
- Airwavz Red Zone Receiver
- UniSoft sendmc multicast subsystem
- Omni-directional TV antenna

