

# Network DVR Solutions

ARRIS Global Services

## FEATURES

- Everything you'd expect from a Network DVR system:
  - Personal Recordings
  - Playback on multiple screens
  - Time Shifted TV
  - Etc.
- Plus a flexible commercial model that allows operators to control the roadmap for their DVR solution



## A FRESH APPROACH TO nDVR

ARRIS approaches the market for Network DVR (nDVR) systems in a unique manner by bringing its software assets and expertise through a professional services engagement which will allow the operator to ultimately take full roadmap control once the initial engagement is complete. Going forward ARRIS Global Services is available to assist, but operators have the freedom to choose their own, or third-party, resources to evolve and expand the system. This model provides the 'best of both worlds' in comparison to a strict choice between 'build' or 'buy' and between "all-in-one" solution providers and massively fragmented solutions requiring operator integration of multiple vendors.

## The ARRIS Solution Set

What assets and capabilities is ARRIS bringing to bear in this market?

1. ARRIS has built software modules and assets which run on our cloud platform and can form the basis of an nDVR solution, greatly accelerating operator time to market for new projects. These modules have been developed in close collaboration with Tier 1 operators in Europe and North America.
2. With over 30 million subscribers using video solutions designed in whole or in part by ARRIS, our Professional Services teams have significant expertise in this space, including experience in delivering multi-vendor nDVR solutions across global markets. ARRIS can provide program management, testing, architecture, third-party vendor management, and other ancillary services crucial to delivery of a next generation TV platform.

## Commercial Approach

The software assets available from ARRIS (and described below) will be licensed in such a way to provide the operator with the right to modify the ARRIS base code to suit its own purposes. The operator will own all of its modifications. The ARRIS Professional Services team will be available to provide development services as desired by the operator.

## Features

Personal recording of broadcast programs.

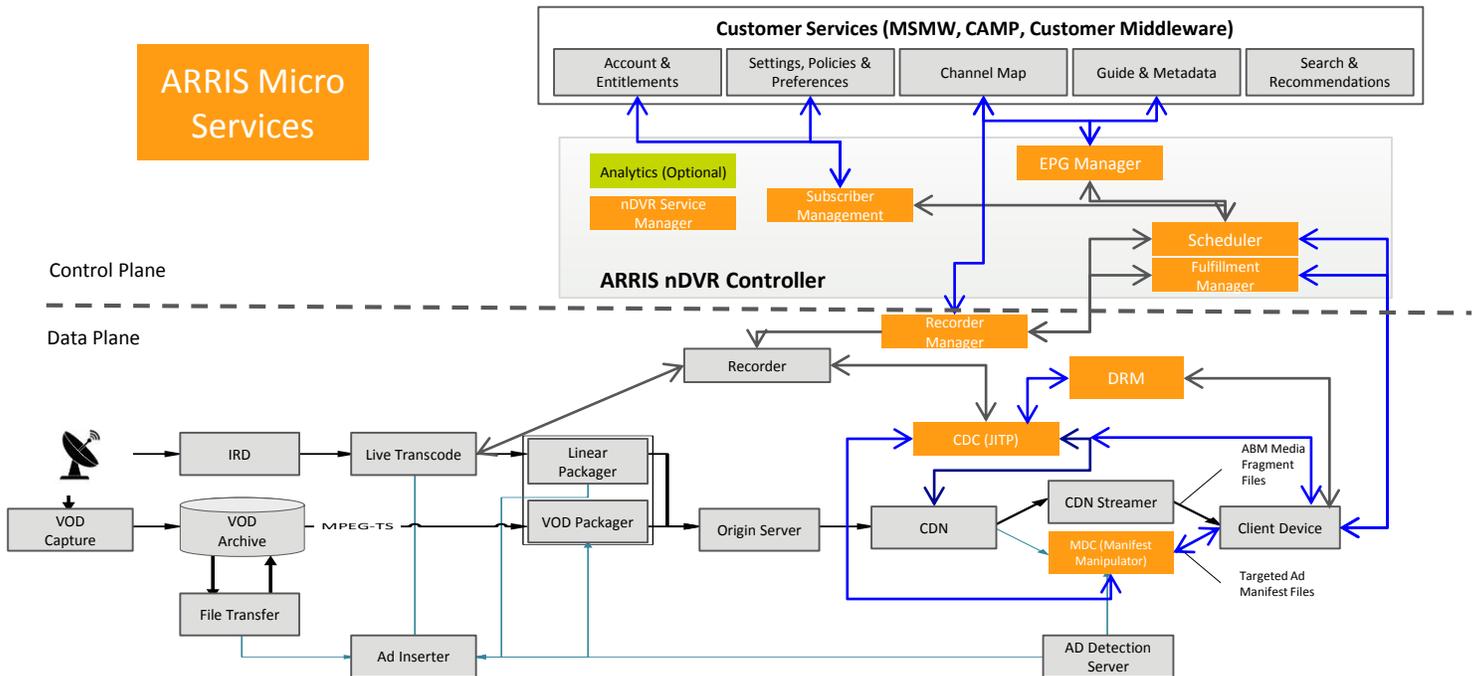
- Each subscriber has his own, unique copy of the recording of a program.
- A subscriber can request a recording of any valid program with extra time before the start or after the end time of the program.
  - The subscriber can playback the recording while it is still in process of recording or after it is complete.

Playback to multiple screens.

- Set Top Boxes
- Computers
- Tablets and phones
- Using HLS

## High Level Architecture

The ARRIS solution design consists of a Control Plane and Data Plane. The Control Plane is made up of ARRIS-specific software modules (“Micro Services”) and exists in the operators centralized data center and provides the intelligence behind the nDVR system while existing in a cloud environment. The Data Plane portion manages the content capture, storage and delivery and is managed and instructed throughout the process of nDVR delivery by the Control Plane. The Data Plane consists of ARRIS Micro Services plus third-party modules integrated by ARRIS.



## Solution Framework that can be Plugged into any Environment

Micro Services	Summary and Value
<b>Scheduler</b>	<p>The scheduler manages recording requests, for both personal recordings and Time Shift TV (TSTV)</p> <p>Main functions of the scheduler.</p> <ul style="list-style-type: none"> <li>Validates subscriber is active (for personal recording).</li> <li>Validates program can be recorded (for personal recording).</li> <li>Generates recording requests for TSTV-enabled channels.</li> <li>Sends recording request to data plane.</li> <li>Maintains status of recordings.</li> <li>Automatically deletes TSTV recordings after the expiration time.</li> </ul>
<b>Fulfillment Manager (FM)</b>	<p>Fulfillment Manager manages playbacks, for personal recordings and TSTV.</p> <p>Main functions of fulfillment manager.</p> <ul style="list-style-type: none"> <li>Validates subscriber is allowed to playback.</li> <li>Validates recording is available to be played back.</li> <li>Provisions DOCSIS resources (for in-home play backs).</li> <li>Creates up playback session.               <ul style="list-style-type: none"> <li>Monitors session during playback via heartbeat to client.</li> </ul> </li> <li>Returns playback URL to client.               <ul style="list-style-type: none"> <li>Directing the client to the Just in Time Packager (JITP) to get content.</li> </ul> </li> <li>Manages playback sessions.</li> </ul>
<b>Subscriber Management System (SMS)</b>	<p>The subscriber management system manages subscriber data.</p> <p>Main functions of subscriber management system.</p> <ul style="list-style-type: none"> <li>Maintains cache of subscriber data containing:               <ul style="list-style-type: none"> <li>List of services the subscriber is provisioned for (service package).</li> <li>List of channels the subscriber is provisioned for (channel package).</li> <li>Status of subscriber.</li> <li>Recording options.</li> <li>Recording quota and currently used quota.</li> </ul> </li> <li>Provides subscriber data to other nDVR Controller components – scheduler and FM.</li> </ul>
<b>Electronic Program Guide Management System (EPG)</b>	<p>The EPG Management System manages EPG data.</p> <p>Main functions of the EPG Management System.</p> <ul style="list-style-type: none"> <li>Ingest and store daily EPG updates from CMS.               <ul style="list-style-type: none"> <li>Program metadata.</li> <li>Program restrictions.</li> <li>Series episodes data.</li> </ul> </li> <li>Sends triggers on ingest for automated scheduling of new programs.</li> <li>Provide interface for validation of EPG data from other nDVR controller components.</li> </ul>
<b>nDVR Service Manager (NSM)</b>	<p>Main functions of the NSM:</p> <ul style="list-style-type: none"> <li>Provision and view channels.               <ul style="list-style-type: none"> <li>Including encoder mapping data for the recorders.</li> <li>Services available per channel.</li> </ul> </li> <li>Provision channel packages ( a list of different channel lineups that could be offered as a package).</li> <li>Provision service packages (different offerings of storage allotment, total number of recordings allowed, number of simultaneous recordings, etc.).</li> <li>View and edit subscriber data.</li> <li>View subscriber recordings data.</li> <li>View and configure nDVR Controller properties.</li> <li>View logs and health monitoring data (a series of reports and charts on the current and historical operations of the system).</li> <li>View recorders and current work load.</li> </ul>