

## Solution Brief: Open Workflows

Accelerate workflows by beginning actions before others complete

The **Open Workflows** option provides a new way to gain greater processing efficiency and speed from Vantage workflows. Using OpenWorkflows can speed up Vantage workflows many times—on the same hardware—due to concurrent processing

### Introduction

Vantage Open Workflows enhance the processing speed of Vantage workflows by enabling most Actions to begin processing before the previous Action has completed. Specifically, Open Workflows are designed to remove the inherent latency that exists between actions within a Vantage workflow. For example, during a Watch Action, a Copy Action can begin to localize the content as it is received and not wait for the entire file to be received.

By reducing the latency between actions within a workflow, more jobs can be submitted to the domain in the same period of time, thus providing greater utilization of Vantage nodes.

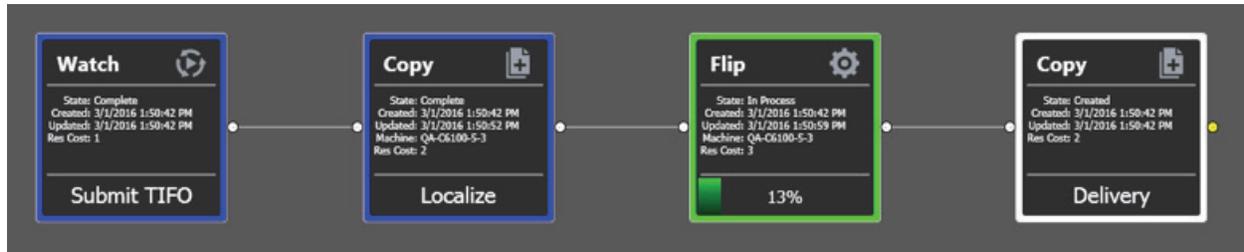
### With Open Workflows you can:

- Reduce the time it takes to make content available to your customers

Open Workflows are a must when getting content on-air as fast as possible. By eliminating the latency between Actions, Open Workflows enable News, Sports and other time-sensitive media workflows to make content available to your customers faster.

- Process more workflow jobs in a domain with existing resources

With Open Workflows reducing the elapsed time of the job, more workflows can be submitted to the same Vantage domain. This provides a better utilization of existing resources.

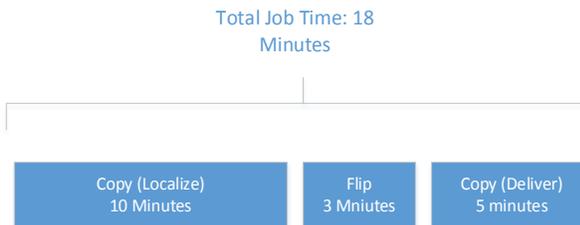


Workflow without Open Workflows

### Open Workflow Processing

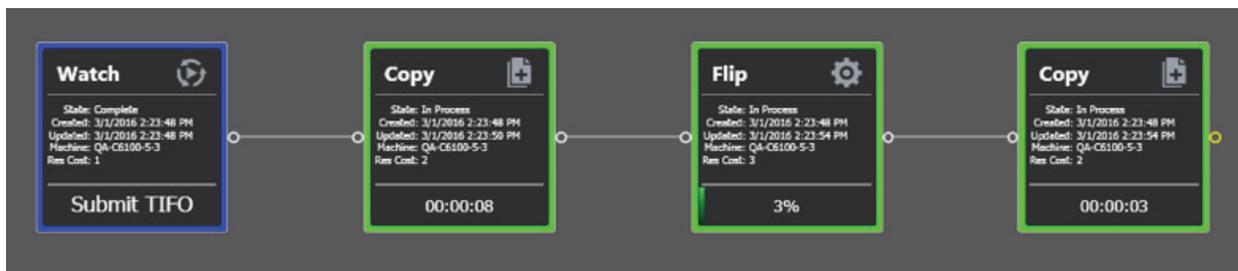
The current processing of Actions within Vantage is characterized as closed, meaning that each Action cannot begin processing until the previous Action has completed. A closed workflow enables the user to systematically control the processing flow, especially when utilizing Service Limits and when explicit control over Vantage nodes is desired. In the diagram above, the blue Actions have completed and the Flip Action has begun working, and the subsequent Copy Action is waiting for the Flip Action to complete. With Open Workflows, certain actions may begin to operate concurrently, removing the inherent latency associated with the discrete steps of a traditional closed workflow.

In the diagram at top, the inherent latency of the job corresponds to the Time of the first Copy + the Time of the Flip + the Time of the second copy. If the initial copy (labeled 'Localize') is pulling from a remote filesystem with poor throughput and this action takes 10 minutes to complete, this implies that the Flip action may not begin processing for 10 minutes. If the Flip action takes 3 minutes and the final Copy takes 5 minutes; this corresponds to a total job time of: 10 + 3 + 5 or 18 minutes. The latency refers to the serial nature of how one action must wait until the preceding action completes, incrementally increasing the overall job time at each step. This cumulative nature of this sequential processing is illustrated below:



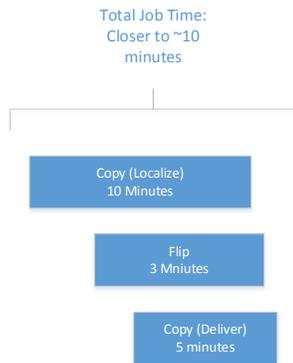
In Open Workflows, most Actions are able to be performed while the previous and subsequent Actions are also being executed. In the above example, just by enabling Open Workflows, the Job Status now looks as shown below.

You can see that the Copy, Flip and the final Copy are all working at the same time. Once the media blocks have been written to disk in the first Copy, the Flip Action is able to read these media blocks and begin the transcode process.



Workflow with Open Workflows

Subsequently, when the Flip Action completes the processing and writes the resultant transcoded media blocks to disk, the final Copy Action moves them to the appropriate destination. Using the previous numbers, the first Copy action will still take 10 minutes. However, since the Flip action and the final Copy action can begin processing immediately, the overall job will be completed in a time that is much closer to 10 minutes. The concurrent nature of this execution is visualized in the diagram below:



### Supported Actions

Many Actions can execute in Open mode—but not all. Additionally, in some instances, the inbound processing to the Action can be Open but the outbound is closed, and vice versa. The following table summarizes the Actions that are supported by Open Workflows.

Also, only file formats that are able to be read while being written (aka growing files) can be supported by Open Workflows. This is fundamentally controlled by both the file wrapper and the codec selected for transcoding operations.

Service	Actions(s)	Open Inbound	Open Outbound	Notes
Monitor	Watch only	N/A	Yes	Only the Windows file system plug-in can be used to monitor and submit a growing, open file
Live	Capture	No	Yes	TIFO only
Transport	Copy	Yes	Yes	Input and output may be TIFO, Transport Stream or Program Stream files; only valid when targeting a Windows file system.
Transcode	Flip	Yes	Yes	Only for supported file formats (see below)
Multiscreen	Multiscreen Flip	Yes	No	Only for supported file formats (see below)
IPTV	IPTV Flip	Yes	Yes	Only for supported file formats (see below)
Edit	Tempo, Conform	No	Yes	Only for supported file formats (see below)
Metadata	All Actions	Yes	No	Instantaneous, no media dependency
Common	Compute/Construct/Decide	Yes	Yes	Instantaneous, no media dependency, actions will not run until input variables are all available

### Open File Formats:

- All actions that are open capable support open TIFO for inbound, outbound, or both depending on the action
- Open Transport Stream is only supported for IPTV Flip and Flip actions outbound
- Open Program Stream is only supported for Flip actions outbound
- Flip actions only support PCM audio for inbound

**Please note** that in order for a transcode-type action to consume an input in open fashion, the decoder must be set to/configured for a format that supports open mode.

Choosing an appropriate file wrapper will greatly enhance the speed of execution for an Open Workflow.

The Telestream Intermediary Format (TIFO) is a good choice for file wrapping as it supports Open Workflows and all codecs. When capturing live content from a Telestream Pipeline HD Dual, the media can be a TIFO wrapped file that can immediately be consumed by a Vantage Open Workflow—for extremely fast live content deployment.

If additional speed is desired, adding a Telestream Lightspeed Server will even further enhance the processing speed and thus, reduce the time to produce media assets.

Open Workflows are ideal for scenarios where media resides on external systems (eg: S3 buckets, FTP locations, and Aspera servers); and this media is desired to be localized, processed and then delivered to external storage locations.

Open Workflows are also ideally suited for Vantage workflows in which one action is creating a mezzanine file for the purpose of a second action creating a specific rendition. For example, Post Producer creating a high resolution mezzanine file followed by the Cable IPTV Flip being utilized to produce a vendor specific Transport Stream.

### Requirements

Licenses are required for Open Workflows and are enabled for an entire domain, or for individual nodes within a Vantage array. If Open Workflow licenses are acquired for specific nodes, then Workflow jobs that need to take advantage of Open Workflow processing can be submitted to these specific nodes.

