videri

About this guide

The Content & Connectivity Best Practices Guide will help videri users achieve the best performance from their Canvas. Within this guide, users will find technical information that, when followed as recommended, will optimize how the Canvas displays content and communicates with the videri Cloud. As such, this guide serves as a useful reference for IT professionals and content designers alike.

Contents

1 Connectivity Best Practices

To function, the videri Canvas must be connected to both a Wi-Fi network and the videri cloud. In this chapter, we cover necessary prerequisites for setting up Canvas communication.

1.1 Connecting to your WIFI

We support the following SSID encryption modes:

- WEP (64)
- WEP (128)
- WPA-PSK (TKIP)
- WPA-PSK (AES)
- WPA2-PSK (TKIP)
- WPA2-PSK (AES)
- WPA2-Enterprise using RADIUS

Connecting to your network **MUST NOT** require the use of certificates or authentication via a landing and/or sign-in page.

Recommendations

- Your Wi-Fi network should have a password.
- There should be no metal beams or concrete walls between the Canvas and the access point. For the best experience, please have the Canvas in line of sight to the access point.
- Your Canvas should be on its own network and should **NOT** be on a network that is used by guests.
- All Canvases should have -70dbm or better signal strength at all times.

1.1.1 Bandwidth requirements

The minimum bandwidth requirement for a typical installation of 20 canvases is 10 Mbps down– and 1 Mbps upstream. Our system will be able to download content, and remain online and in sync on as little as 200kb/s per canvas. Larger installations needing sync should consider higher bandwidth upstream connections.

1.1.2   Data consumption

On an ongoing basis, the Canvases will download and upload 1.5 Mb/day when operating with consistent content. Data consumption will vary based on Schedule changes.

1.2   Connecting to the videri Cloud

All cloud-based network communications are initiated by the Canvas and **DO NOT** require routable IP addresses.

The Canvas uses the following **outbound** ports and protocols:

TCP Protocol	Port(s)	DNS
HTTP	TCP 80	Any. Your Canvas can contact public websites as part of normal signage operations. DNS will depend on content.
HTTPS	TCP 443	
XMPP	TCP 5222, 5223	msg.videri.com
ICMP	ICMP	
MQTT	TCP 1883, 8883	mqtt.videri.com **//** mqtt.videri.com (SSL-enabled)
NTP	UDP 123	The following NTP pools will be contacted: time.nist.gov 0.android.pool.ntp.org 1.android.pool.ntp.org 2.android.pool.ntp.org 3.android.pool.ntp.org 0.us.pool.ntp.org 1.us.pool.ntp.org 2.us.pool.ntp.org 3.us.pool.ntp.org **NOTE**: Each pool contains 1000s of individual servers with specific IPs. Generally, it is required to whitelist the NTP protocol rather than individual IPs.

2 Content Best Practices

When working with content, keep in mind:

1. Active display area of the Canvas
2. Supported file format for content
3. Minimum required resolution for content

2.1   Active display area

The table below provides active display area for different Canvas models.

Canvas	Display area (inches)	Display area (millimeters)
VQ	18.7" x 18.7"	476 x 476
V2	16.10" x 9.05"	408.9 x 230
V3	27.5" x 15.5"	698.4 x 392.9
V4	33.6" x 18.9"	853.9 x 480.3
V5	42.3" x 23.8"	1073.8 x 604

2.2 Image guidelines

The table below provides guidelines for uploading images to the videri cloud.

File format	PNG*, JPG, JPEG
Max file size	3 GB
File compression*	Enabled
Data type	24-bit, RGB color space
Minimum required resolution ** (in pixels)	VQ: 1920 x 1920
	V2-5, portrait: 1080 x 1920
	V2-5, landscape: 1920 x 1080

* For lossless compression, we recommend uploading images in PNG format.
** Provided resolutions are for images scheduled to individual Canvases. For guidance scheduling images to Walls, see Resolution requirements for images scheduled to Walls.

2.3 Video guidelines

The table below provides guidelines for uploading videos to the videri cloud.

File format	MP4
Max file size	3 GB
Minimum required resolution (in pixels)	VQ: 1920 x 1920
	V2-5, portrait: 1080 x 1920
	V2-5, landscape: 1920 x 1080
Maximum resolution* (in pixels) **NOTE:** Videos uploaded in 4K will display in full HD when scheduled to single Canvases. Videos will only play in 4K on Walls.	VQ: 2160 x 2160
	V2-5, portrait: 2160 x 3840
	V2-5, landscape: 3840 x 2160

Video guidelines, continued—

Video specs	
Codec	H.264, Main Profile
Bitrate**	10-30 Mbps
Frame rate	30 fps
Chroma format	4:2:2
Audio specs	
Codec	Multi-channel PCM – 48 kHz 16-bit Stereo (Little Endian)
Audio channels / streams (2.0 stereo)	Ch. 1 – Left Ch. 2 – Right
Audio channels / streams (5.1 stereo)	Ch. 1 – Left, front Ch. 2 – Right, front Ch. 3 – Center, front Ch. 4 – Low frequency Ch. 5 – Left, back Ch. 6 – Right, back

* The Canvas will **not** play videos with resolutions exceeding the max specifications. For guidance on how to achieve higher quality when scheduling videos to Walls, see ACHIEVING HIGHER QUALITY FOR VIDEOS SCHEDULED TO WALLS.

** Our system supports both constant and variable bitrate.

> **NOTE**: B-frame compression is not supported.

Recommended video format:

1080p H.264 Main Profile @ 30fps, constant bitrate, 10-30 Mbps AAC 22hHz stereo @ 112 kbps

In addition to uploading video content in the recommended format, we also support the following codecs and containers:

Container	Codec	Description
3g2	mpeg	QuickTime MPEG-4 Motion JPEG 2000 format
3gp	mpeg	QuickTime MPEG-4 Motion JPEG 2000 format
3gpp	h263	Files with .3gpp extension (differs from .3gp and .3g2)
avi	dvsd	AVI format
f4v	h264	Adobe Flash Player video
flv	h264	
h264	h264	Raw H.264 video format
m4v	h264	Raw MPEG-4 video format
mkv	h264	Matroska file format
mov	mpeg	QuickTime MPEG-4 Motion JPEG 2000 format
mp4	mpeg	QuickTime MPEG-4 Motion JPEG 2000 format
mpeg	mpeg	MPEG-1 system format
mts	h264	Advanced Video Coding HD - Sony/Panasonic HD camcorder format
ogv	theo	Files with the .ogv extension (differ from .ogg)
webm	vp8	

NOTE: Our system will transcode these containers and codecs upon ingestion.

3 Walls Best Practices

A Wall is a group of Canvases that function in tandem to act as a video wall.

3.1   Resolution requirements for images scheduled to Walls

The minimum required resolution for images scheduled to Walls depends on the configuration of your Wall.

To calculate minimum required resolution:

1. Add the resolutions of all Canvases widthwise (W).
2. Add the resolutions of all Canvases lengthwise (L).
3. Your minimum required resolution, in pixels, is W x L.

For further guidance, refer to section **7.1.1 Resolution specifications** in our **Ops Portal Fundamentals** guide.

3.2   Achieving higher quality for videos scheduled to Walls

As mentioned in Video guidelines, Canvases will **not** play videos that exceed maximum specified resolutions. When scheduling videos to larger Walls, we recommend cropping video content and generating a video for each Canvas that is part of the Wall.
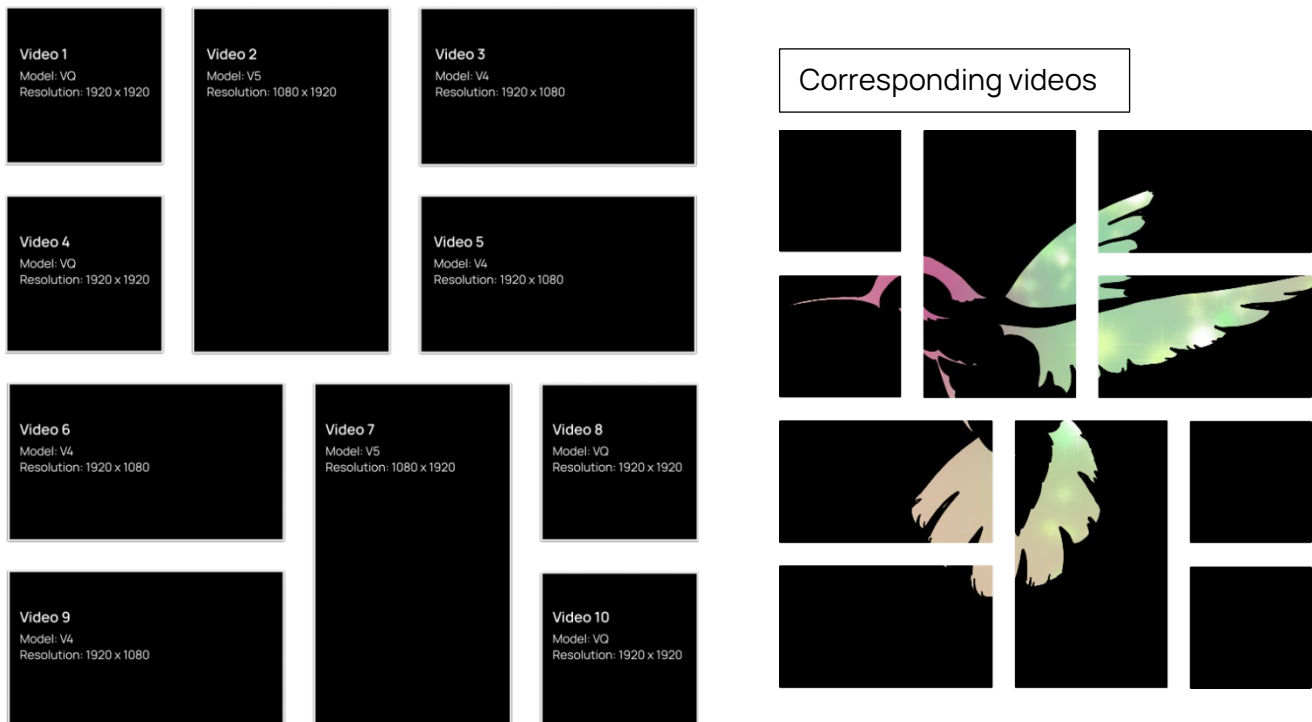
3.3 Content synchronization

The values in all tables in this section were measured after the RMS value of error on **ntpd** was under 1ms using Wi-Fi within the operating parameters described in Chapter 1.

3.3.1 Sync tolerance

The system currently supports frame-level accuracy for multiple screens showing videos. Sync tolerance for videos is 30ms ± 7ms.

Additional bandwidth-related parameters to consider:

Latency	Our system will function correctly with packet delay of up to 1 second.
Jitter	Packet jitter over 500ms on a normal distribution will produce ± 15ms desync between Canvases. This will cause a delay of approximately 1 frame.
Packet Loss	Our system will function normally up to 15% packet loss. 50% packet loss will produce a permanent offline status. Units will lose sync over a period of 24 hours at 50% packet loss.

3.3.2 Transition tolerance

Transitions between content items are measured in terms of error-in-milliseconds between multiple screens.

Transition	Transition tolerance
Image → Image	16ms ± 16ms
Image → Video	16ms ± 16ms
Video → Image	16ms ± 16ms
Video → Video	16ms ± 16ms

4 Contacting support

The fastest way to contact Support is via email at support@videri.com.

When contacting support, please copy and paste the following template into the email:

Canvas Name:
Serial Number:
Link to Canvas: the actual URL from your browser's address bar
Description of problem:

You can find all needed information on your Canvas' page in the Ops Portal.

We'd love your feedback!

We are always looking for feedback to improve documentation for our users. If you have any feedback about this guide, please don't hesitate to reach out to us at feedback@videri.com.