Micro Local Cameras – Best Practices

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With an investment in one or more Micro-Local cameras (Skycams, WxCams, etc) there are going to be some high expectations from viewers as well as station management. Adding reliability and security to these cameras doesn't have to be complicated. There are a few things you can do to make sure your teams get everything they expect from your investment by following a few suggestions we will present in a series of articles.

Best Practices – Remote Internet Service Checklist

It seems all the good locations for Micro local Cameras are somewhat *Internet challenged.* Before you can deploy a camera at some far-flung location there are some guidelines that can be helpful when getting your service set up.

It's all about the Upload Speed

While some Internet services are bisymmetrical, most are not. This means that Upload bandwidth will be different from Download bandwidth. When negotiating for service it is common to be presented with your "connection speed." Often, this is the nominal *download* speed of the connection you are purchasing. If the person is not certain if the connection is bisymmetrical – then it is likely *asymmetrical* service – which means the upload speed of the service you are purchasing will be significantly slower.
This is common.
When deploying a camera, we really do not care much about download speed – it's all about the available *upload* speed from the remote location. Remember, the camera is sending video from the remote location to your facility – and that is all done via the available upload bandwidth. If upload bandwidth is constricted, then your video framerate and/or resolution will have to be reduced to accommodate the slower speeds.

5 to 10+ Mb *Upload* Speed is Recommended

Having 100 Mb down and 1 Mb up is a significant restriction. Most ISPs do increase upload speed as you increase your download service – so you may find you will need to pay for a lot more download speed just to get enough upload speed. How much is enough?

As a guideline, don't settle for less than 5 Mb up – and 10 Mb (or more) is better.

It's going to be important to nail this down prior to contracting for service. If an ISP cannot commit to an acceptable upload speed – then it's possible you may wind up having to compromise resolution and/or framerate – or use a different ISP if possible.

Testing Upload Speed

There are any number of speedtest sites out there. Unfortunately, you can only test your Internet speed *after* your ISP has installed service. Therefore, it is going to be important to get information about your download and upload speed in writing. You can only test your available upload speed from the remote site.
To test your speed you will need to use a laptop; connect to the internet and then use a speedtest service such as the free one at www.speedtest.net.

> *Note: Videstra has developed Reverse Bandwidth Test software that works with Axis Cameras. This software can check your remote sites upload bandwidth from your facility. This software is available upon request – but only works once you have your remote site completely set up.*

Fixed IP vs Dynamic IP

Because saving money is important, it is always tempting to purchase lower cost Internet service. In most cases this means you will not get a fixed IP address. To reliably connect to your camera, you will need either a fixed IP Address or you must link the remote site to a DDNS (Dynamic DNS) service such as NoIP or DynDNS.org.

You will need either a fixed IP or a DDNS Link

Linking your remote site to a DNS service requires that the router at your remote site has support for a DDNS service (NoIP and DynDNS.org are only two of many) – or you may have to install a small computer (such as a Raspberry PI) and run a DUC (Dynamic Update Client). We do not recommend this.
Videstra recommends the following:

1. Secure a static IP Address
2. Utilize a ***router supported*** DDNS service (e.g. Cisco rv340)

Avoid installing additional HW and a DUC to support DDNS – it is a significant failure point worth "ducking" (see what I did there?).

> *Note: There is a yearly cost to utilizing a Dynamic DNS service (such as NoIP or DynDNS) so you should weigh that cost against the cost of obtaining a fixed IP from your ISP.*

Commercial vs Consumer Service

Again – to save money you may be choosing between a commercial account (that can cost significantly more) or a consumer account. While a consumer level ISP account will be cheaper you will not have access to their commercial support team (if there is one). Most problems you will encounter will be very complex (bad routes, service with significant valleys) and the consumer support team actively ignores issues like this. On the commercial side there are typically people who understand their network better and they will often respond to difficult issues. You will also get a better relationship and deeper contact points within your ISP with a commercial account.

We recommend you investigate the differences between commercial and consumer level accounts with your potential ISP before committing. Sometimes you will not be given a choice once they know they are dealing with a television station. Also – requesting a fixed IP often triggers a discussion with the ISP on the need for commercial level service.

Incoming Ports Allowed

Some ISPs will not let you open certain incoming ports. Spectrum (formerly Charter) routinely disallows incoming port 80 connections on their consumer level service. They do allow other incoming ports. While it is likely rare that any ISP would block *all* incoming ports, be sure to ask about it. If all incoming ports are blocked, you wouldn't have any possible way to connect to your camera.

If certain incoming ports are blocked, you can work around that. Connection to most camera control is done via port 80 (via the http protocol). If port 80 (incoming) is blocked, then you can port forward from any other port (we would recommend 42080 for no reason other than it is decent *security through obscurity* – more on security in a later article). Port forwarding is set up in the connected or integrated Router on your DSL/Cable modem at the remote site.

We recommend you never change the connection port on the camera directly – always port forward an external port (such as 42080) to port 80 on the camera. Some cameras do allow you to change ports – don't do this as it will make recovery from some network issues difficult (as in requiring an on-site visit). *Always use default ports on your camera(s)*.

Access to Router Setup

By default, routers typically do not let you make changes via their WAN connection (ostensibly for security reasons). One assumption is that routers are always located in convenient places in and around your office. This is not the case with a remote camera.

When your ISP sets up your service, if they provide a router, make sure they enable router configuration from the WAN connection. Without this capability you will only be able to make changes to your router while on-site.

> *Note: Most routers will require you to use https access for configuration. Just type https://<ip address>/… for connection to the router. The router will have its own username and password.*

If your ISP does not provide a router, Videstra recommends the Cisco RV340 router which allows port forwarding and Dynamic DNS through DynDNS.org.

There will be more information on ports and security in our mid-November article on Camera Security.