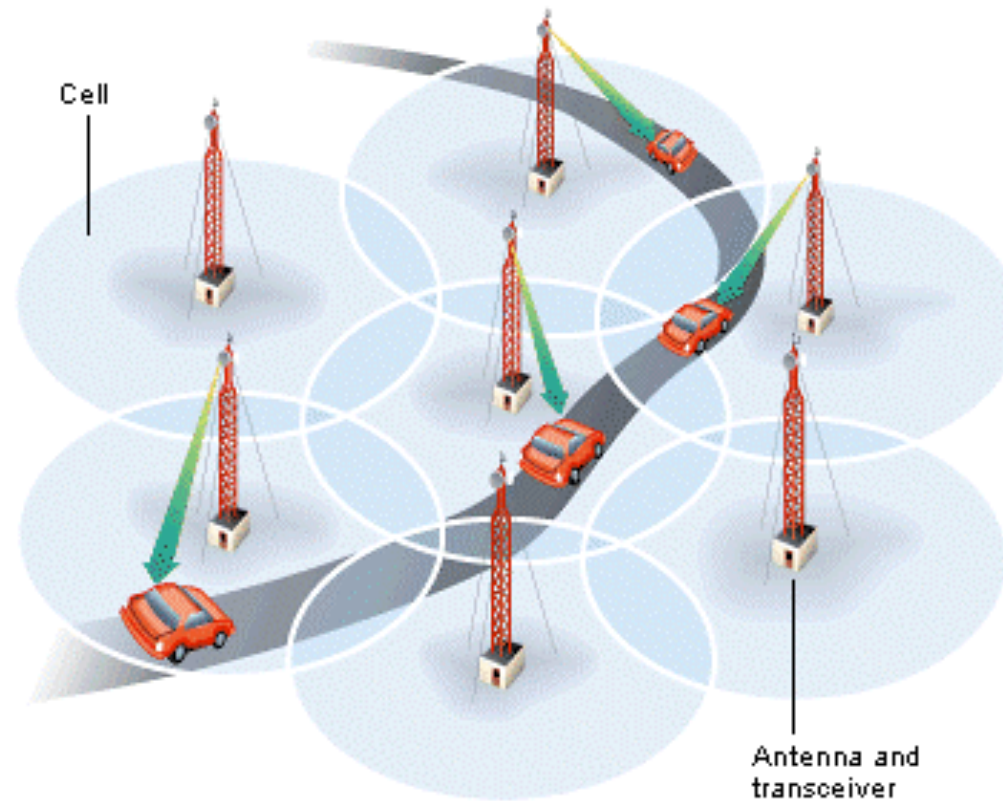


GPRS & 3G Communications Webinar from



Introduction to cellular communications &
Step-by-step guide to setting up a 3G router

What is a cellular network?

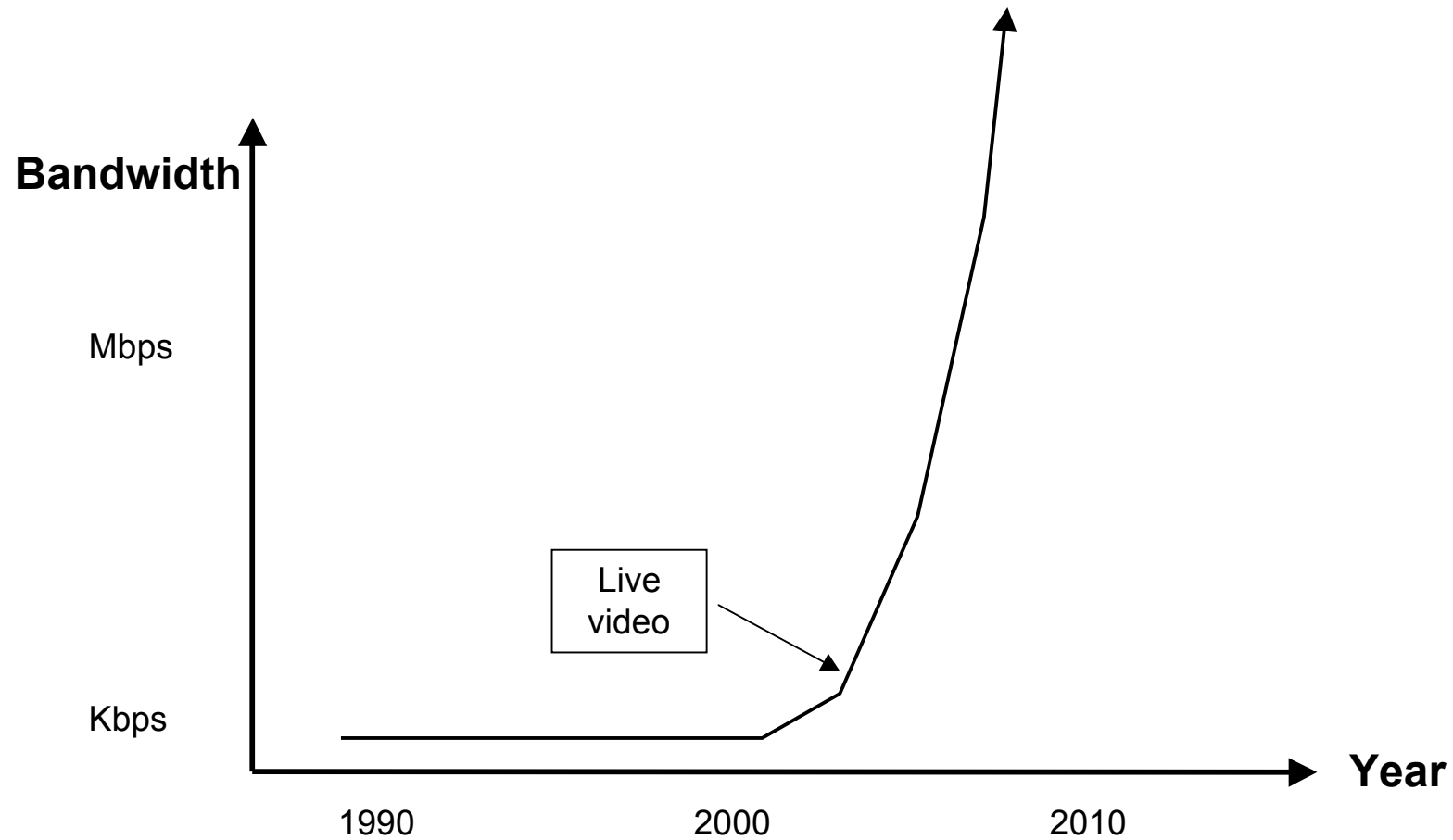


Approximately 2.6 billion GSM & 3GSM connections to date

Network evolution (UK):

- 1G Non-standardised 'analogue' cellular networks – 1980s
- 2G GSM - ETSI standards based technology formally announced - 1991
- 2.5G GPRS - 'IP' based extension to GSM for low speed data transfer - 2001
- 3G UMTS – New carrier for voice and data, 2.1GHz RF band - 2003
- 3.5G HSPA – HSDPA & HSUPA – Megabit cellular technology – 2005
- 4G LTE - wire speed Ethernet over the air - 2011?

Cellular bandwidth developments

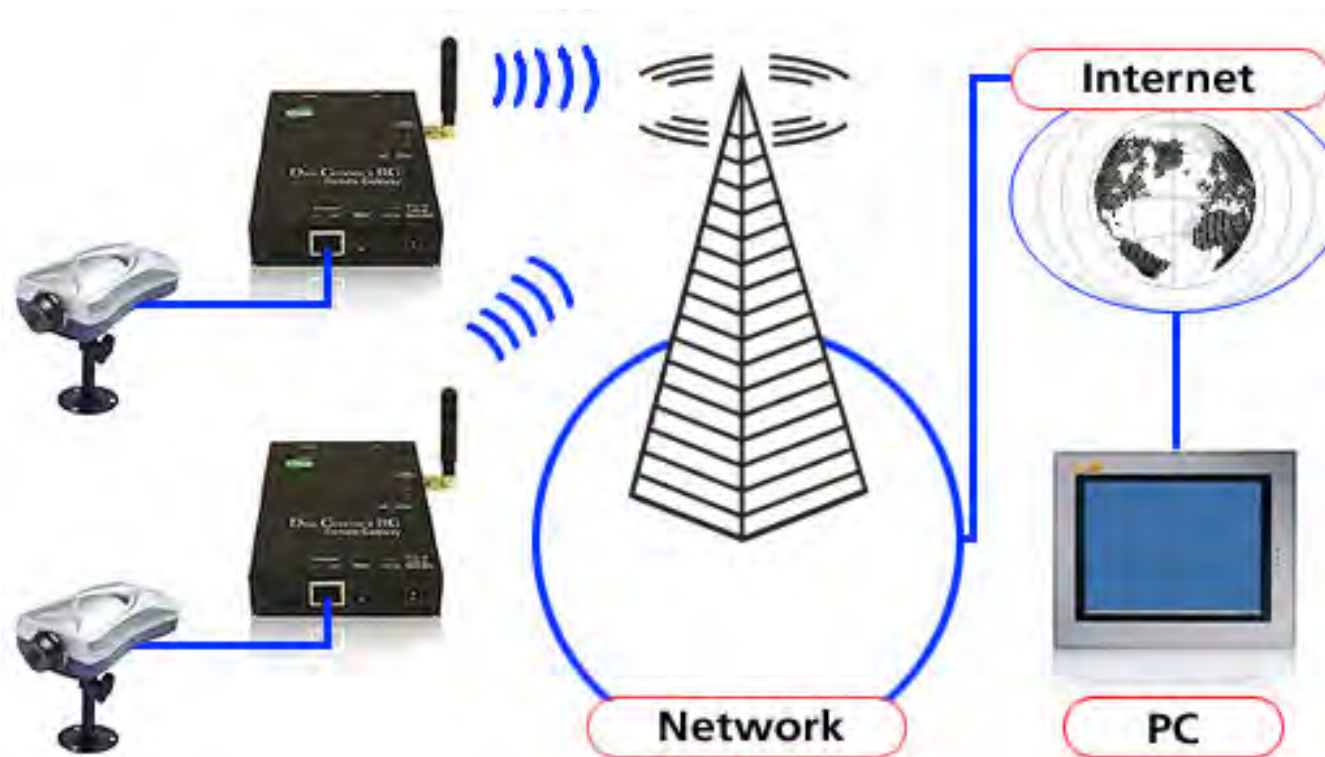


Real-world Bandwidth

	GPRS	EDGE	3G	HSDPA	HSUPA
Theoretical maximum upload (kbps)	42.8	118.4	64	384	1.8Mbps
Typical real world upload (kbps)	10-20	80-100	50-60	200-300	
Theoretical maximum download (kbps)	85.6	177.6	384	7.2Mbps	7.2Mbps
Typical real world download (kbps)	30-40	130-160	180-230	600-900	

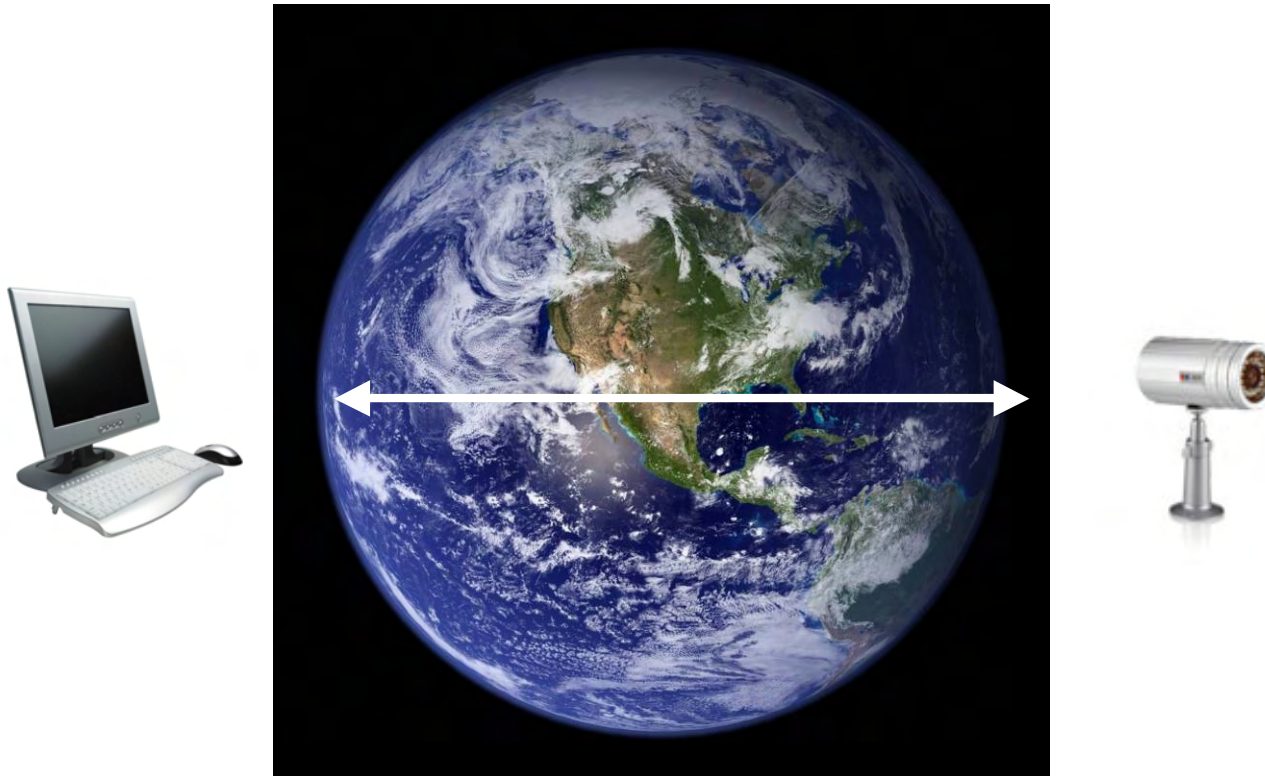
(All units are kbps unless otherwise stated)

Typical GPRS/3G topology



The Marketing perspective

“A serial or Ethernet cable the length and breadth of the globe.....”



Tools of the trade:



GSM / GPRS / 3G
modules + engines

GSM/GPRS
modems



GPRS, 3G & HSDPA
Routers



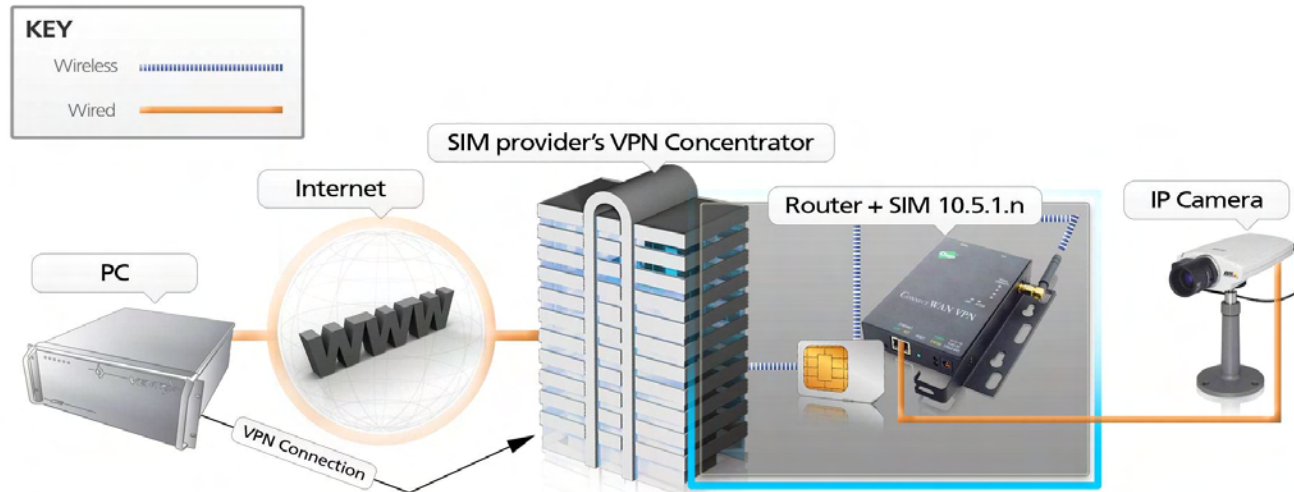
How to set up a 3G router for live video*

- Router: Digi Connect WAN 3G – industrial 3G router
- Camera: Axis 211 – IP camera
- SIM card: Vianet – 3G enabled SIM with VPN service

- Accessories: Patch leads / Power supplies

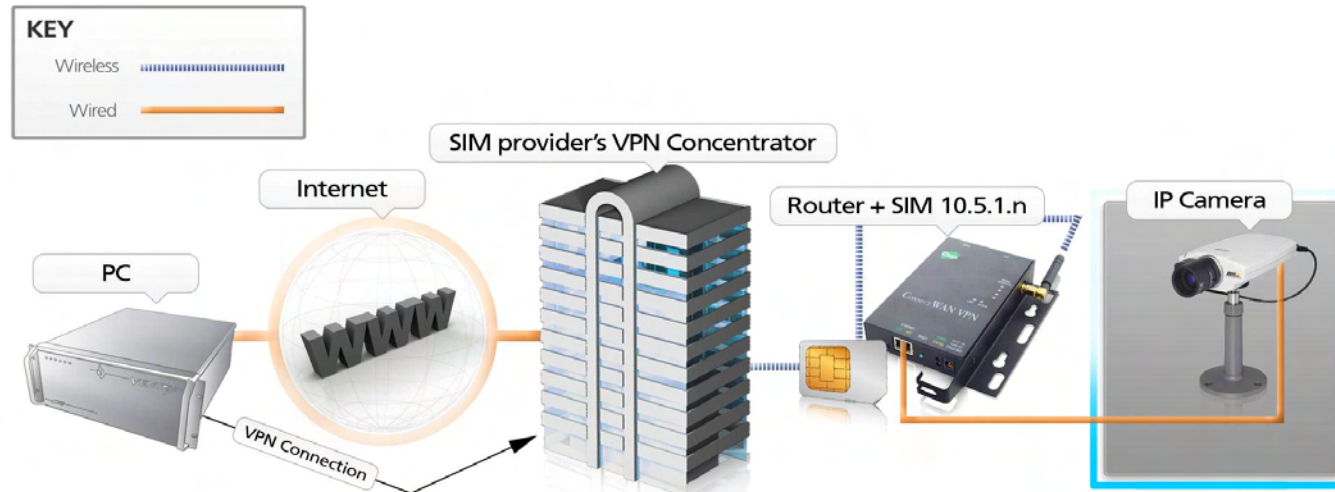
*NB – there are several ways in which this can be achieved, in this example we illustrate the requirements for a relatively simple and secure connection to an IP camera or any other Ethernet device.

Step 1: Install SIM in router & power up



Configure the router's APN settings, IP address & port forwarding.

Step 2: Connect camera to router & configure

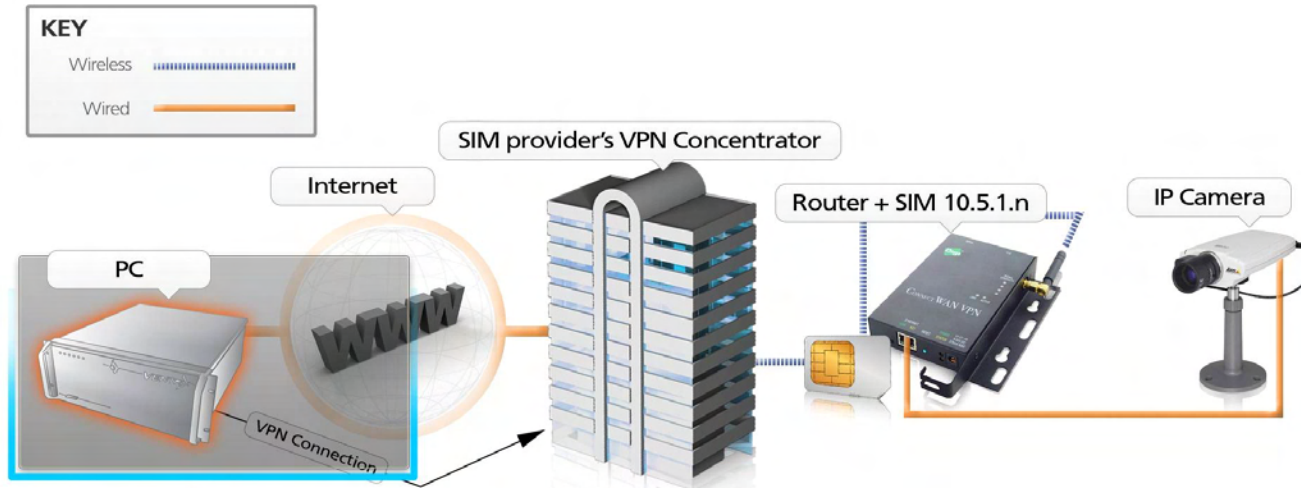


Configure the IP Camera to be on the appropriate subnet.

Key configuration parameters:

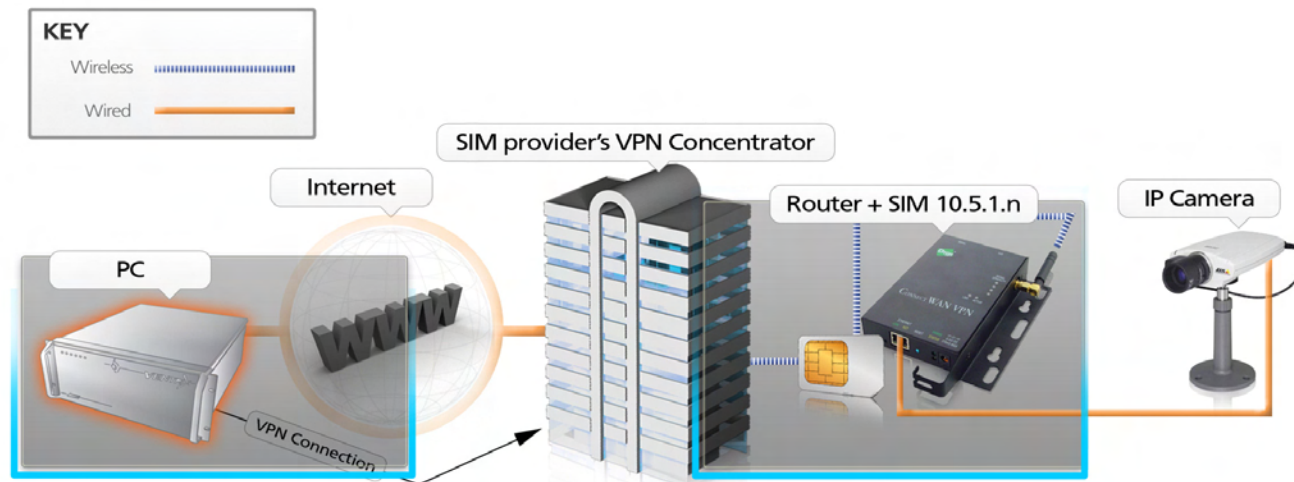
- 1) Apply static IP address, subnet mask & **default gateway** for IP camera and every other LAN connected device
- 2) Configure APN details in router menu eg.
APN = vianet.uk, Username = user, Password = password
- 3) Configure PAT (port forwarding) in router menu eg.
10.1.5.1:80 to **192.168.1.10:80**

Step 3: Install & configure VPN client



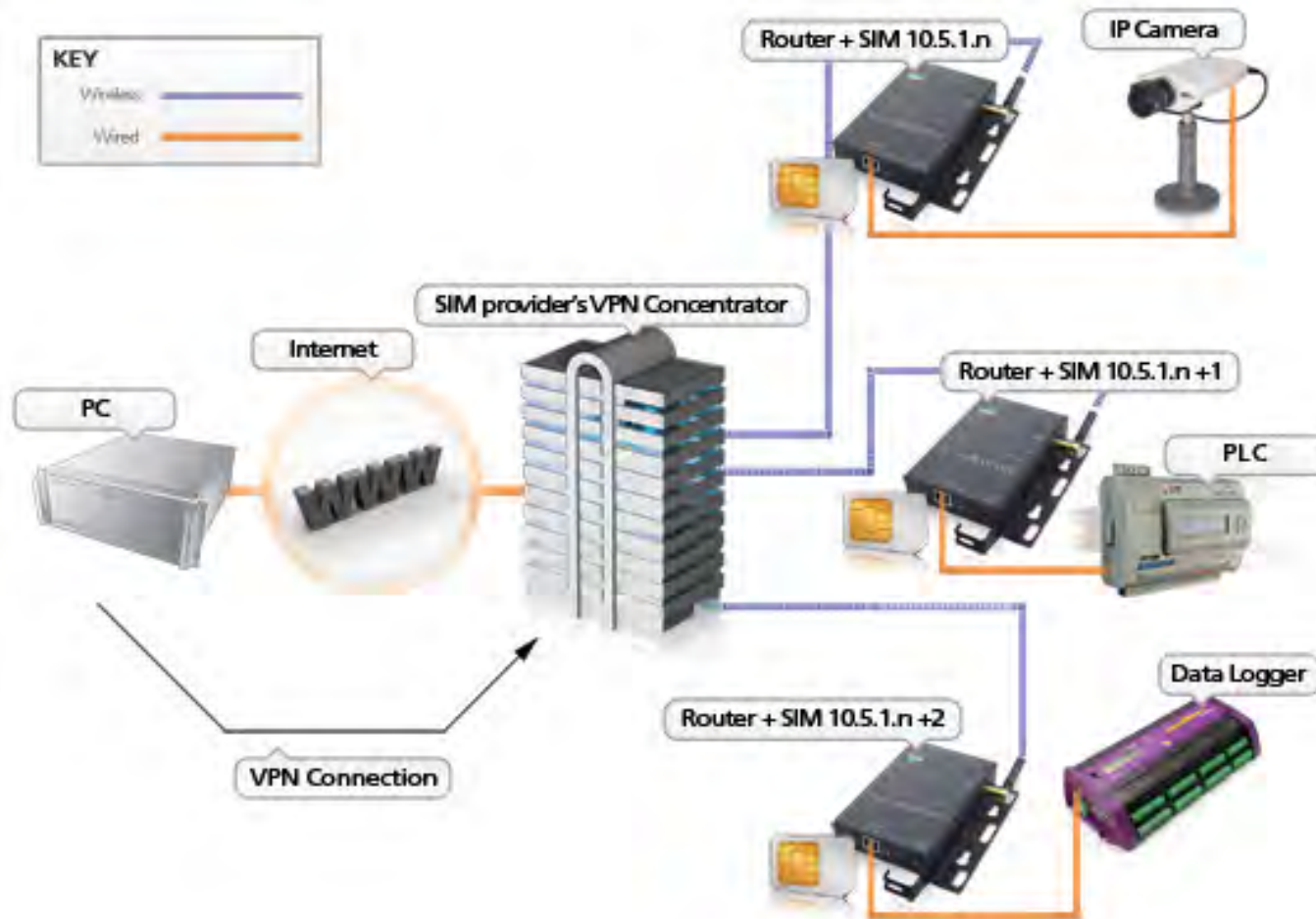
Configure the IP Camera to be on the appropriate subnet

Step 4: Check connection to router



Ping the WAN side of the router, then the LAN side and finally the IP address of the IP camera to verify the integrity of the complete link.

Step 5: Expand !



Thank you.

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