Covid-19 and NRENs: Counting the Cost

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Three themes:

— Impact on organisational priorities
— Impact on financial sustainability
— Impact on organisational culture

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Somewhat anecdotal presentation, heavily based on TENET's experience, with some insights learned from colleagues in other UbuntuNet NRENs.

A year ago we knew of six coronaviruses that cause disease in humans. The seventh has been known to us for less than a year, but its impact in that time has been massive.
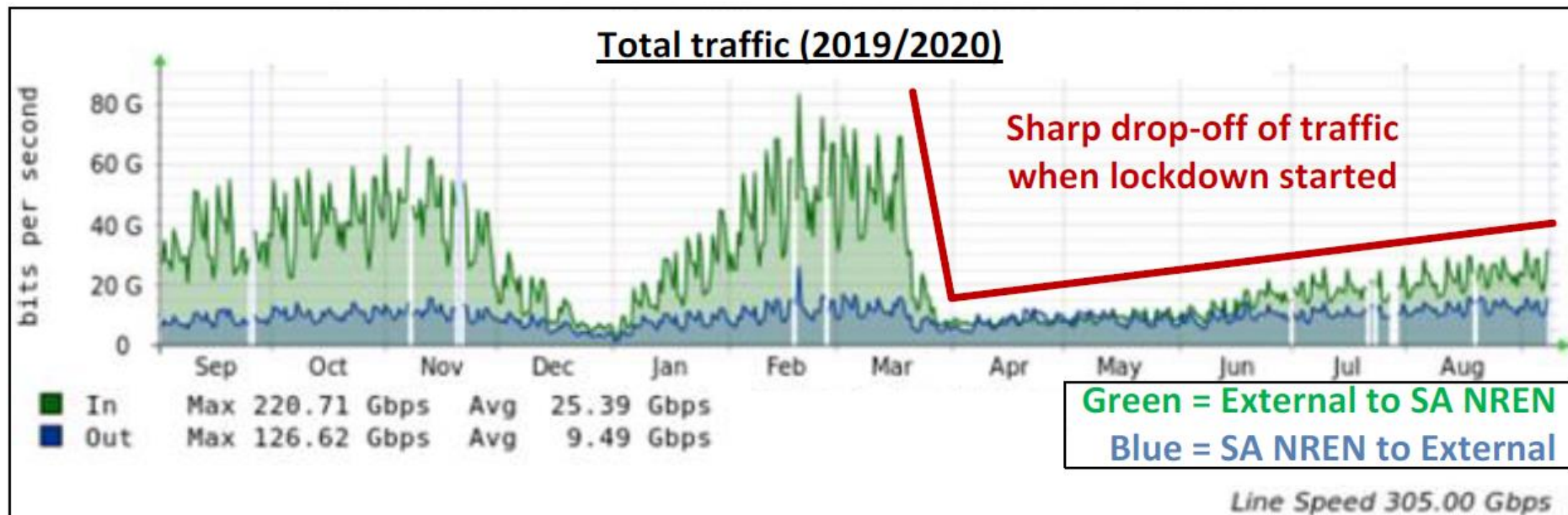
55 million cases

More than 1.3 million fatalities

Enormous economic dislocation and damage

Lasting societal impact

For most of UbuntuNet's NRENs the pandemic brought substantial challenges.

The common theme in these challenges is lockdown as a public health response to the pandemic.

Lockdown emptied universities, and bandwidth utilisation for many dropped to almost zero.

Total traffic (2019/2020)

Sharp drop-off of traffic when lockdown started

Green = External to SA NREN
Blue = SA NREN to External

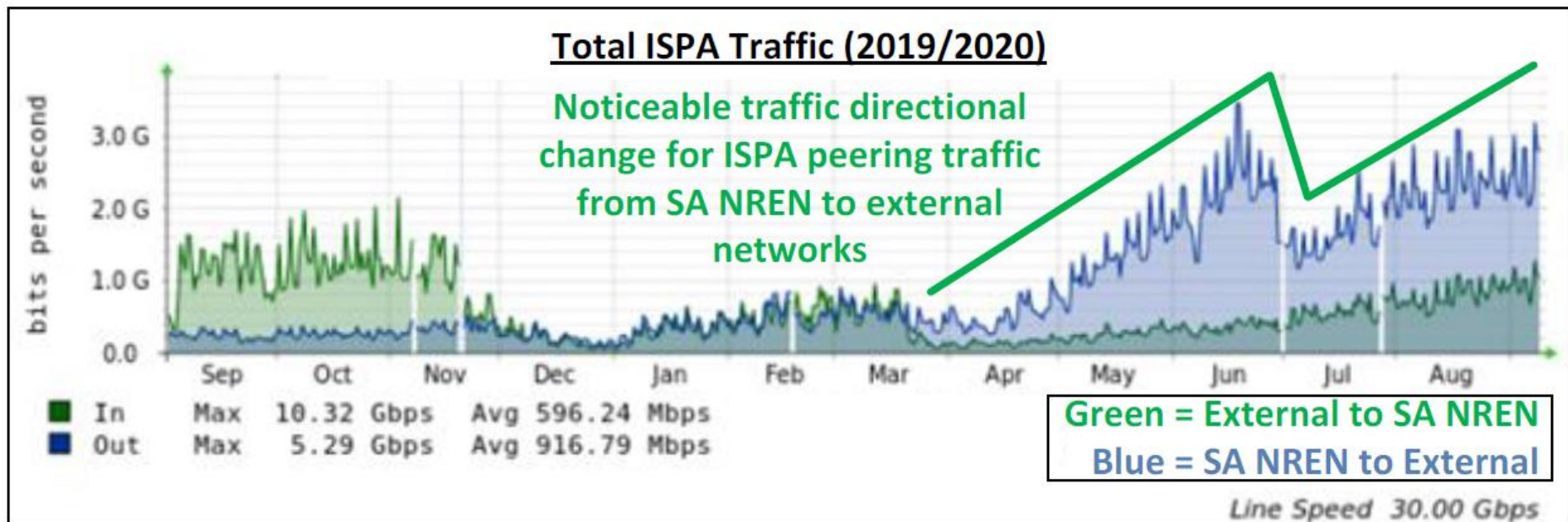|		Max		Avg	
■	In	220.71 Gbps		25.39 Gbps	
■	Out	126.62 Gbps		9.49 Gbps	

Line Speed 305.00 Gbps

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Universities pursued temporary alternatives to campus-based teaching activities, generally termed emergency remote teaching.

For many, support from their NREN has been critical to success.

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Generally speaking only a minority of students were able to adapt to emergency remote teaching without assistance. A key issue here in most cases has been a lack of bandwidth available to students in their homes.

In South Africa this led to strong reliance on the mobile networks to connect students to learning resources.

Total ISPA Traffic (2019/2020)

Noticeable traffic directional change for ISPA peering traffic from SA NREN to external networks

In	Max	10.32 Gbps	Avg	596.24 Mbps
Out	Max	5.29 Gbps	Avg	916.79 Mbps

Green = External to SA NREN
Blue = SA NREN to External

Line Speed 30.00 Gbps

Some NRENs became closely involved in extended negotiations with these operators. Others assisted their institutions by hosting Learning Management Systems for free.

Providing access to videoconferencing software and cloud services became an important issue for many NRENs.

Extending eduroam access and deploying eduVPN seemed promising adjuncts to reliance on mobile network operators.

For some NRENs the primary consequence of lockdown was a threat to their financial sustainability. As governments mounted expensive public health responses, they reprioritised their spending, sometimes away from higher education.

At the same time many universities had to spend money on mobile data for their students, just as their budgets were being cut by their governments. Reducing their orders for NREN bandwidth seemed the obvious way to make up financial shortfalls.

The impact on organisational culture should not be overlooked. Lockdowns have brought new ways of doing things ...

… but the long-term effects of a spatially distributed organisation will pose challenges for many.

All pandemics bring some societal changes that are temporary and some that are permanent. The greatest long-term threat to NRENs is a permanent change in the nature of universities.