

# Strategies for mitigating network congestion in real-world events

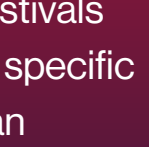
## Common network congestion scenarios

As businesses increasingly depend on reliable connectivity, network congestion poses a significant threat to operational efficiency and customer satisfaction. High-demand situations, like live broadcasts and emergency responses, often strain traditional networks, revealing the necessity for advanced solutions.

Effective network management requires a blend of strategies to address and alleviate congestion, especially in scenarios like these:

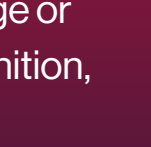


### LARGE-SCALE GATHERINGS



Large-scale events like concerts and festivals lead to high concentrations of people in specific areas. This surge in network demand can overwhelm local cell towers, resulting in slower data speeds, dropped calls, and potential risks to public safety if emergency communications are compromised.

### LIVE BROADCASTS



When live events, such as news coverage or sports games, are streamed in high definition, the demand for bandwidth increases significantly. The surge in viewer traffic coupled with content uploads can lead to network congestion, causing buffering, latency, and a degraded viewing experience. This can lead to loss of audience and advertising revenue.

### HIGH-TRAFFIC PERIODS



Events like major holiday sales lead to predictable spikes in online activity. As people engage in online shopping and communication, the increased data traffic can strain networks, causing delays, frustrating users, and potentially requiring businesses to upgrade infrastructure to cope with demand.

### HIGH POPULATION AREAS



Areas with dense populations, such as airports, train stations, and hospitals, experience a high number of simultaneous connections. This can result in network congestion, slowing down communication, affecting productivity, and potentially delaying access to critical services like telemedicine or emergency response.

### HIGH USAGE APPLICATIONS



The use of data-intensive applications like AR/VR and the extensive connectivity required for smart city infrastructure can put significant strain on networks. This increased need for real-time data demands can lead to increased latency and potential network failures, disrupting both user experiences and essential city functions.

### EMERGENCY SITUATIONS



In emergencies like natural disasters or pandemics, maintaining clear and reliable communication is vital for coordination, emergency responses, disseminating important information, and ensuring public safety.

Singtel's Business Critical Push-To-Everything (BC-PTX) solution addresses network congestion in high-stakes scenarios by leveraging network slicing to prioritise critical communications. This ensures that essential services remain reliable and operational during crises, even under heavy network strain.

## Strategies for managing network load

Enhance performance and maintain seamless connectivity by implementing these key approaches:

1



### PROACTIVE NETWORK MONITORING AND DYNAMIC RESOURCE ALLOCATION

Identify congestion and adjust resources in real-time

### NETWORK OPTIMISATION

Upgrade hardware and optimise configurations



2

3



### LOAD BALANCING AND CACHING

Distribute traffic and use caching to reduce server strain

### CONTENT DELIVERY NETWORKS (CDNS)

Deliver content closer to users for better performance



4

## How 5G network slicing solves network congestion

With **5G network slicing**, businesses can manage and alleviate network congestion, and ensure seamless performance and scalability tailored to their needs.

**Network slicing** offers the following benefits:

### DEDICATED AND ISOLATED NETWORK RESOURCES

Ensure high-demand applications receive the resources they need.

### CUSTOMISED PERFORMANCE AND PRIORITY HANDLING

Adjust parameters for different applications and set priorities.

### FLEXIBLE SCALABILITY

Scale resources up or down as needed.

### ENHANCED SECURITY

Contain potential breaches to protect overall network stability.

5G

### TRADITIONAL NETWORKING

Relies on fixed, physical networks that lack the adaptability of slicing.

Often involves overprovisioning to handle peak loads, leading to inefficiencies.

Performance can degrade significantly during high-traffic periods due to shared resources.

Often requires extensive infrastructure investment to accommodate diverse needs.

### Flexibility

### Resource allocation

### Performance during peak loads

### Cost efficiency

### 5G

✓ Allows for dynamic creation and adjustment of network slices based on real-time demand.

✓ Efficiently allocates resources to different slices, preventing congestion and optimising performance.

✓ Ensures high performance by prioritising critical applications and isolating traffic.

✓ Reduces infrastructure costs by eliminating the need for multiple physical networks.

## Key technologies supporting 5G network slicing

### 1. NETWORK VIRTUALISATION

Utilises virtualisation to create multiple logical networks on a single physical infrastructure.



### 2. USER EQUIPMENT ROUTE SELECTION POLICY (URSP)

Manages data routing to optimise performance for specific applications and devices.



### 3. APPLICATION DETECTION CONTROL (ADC)

Adjusts network slices based on the application requirements, ensuring optimal performance.



### 4. RADIO RESOURCE PARTITIONING (RRP)

Allocates radio resources dynamically to different network slices for better efficiency.



## Prevent and solve network congestion today

Discover how tailored network solutions can optimise your business operations and improve user experiences.

Find out more at [5G network slicing](#)

Contact us