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# Class of Service

## For Guaranteed Network Performance

This white paper explores how you can plan a CoS strategy

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# Why do you need Class of Service?

Class of Service (CoS) is a way of differentiating between the different types of traffic that travel across enterprise networks, enabling organisations to prioritise applications and services, maximising the use of available bandwidth for the benefit of the business and ensuring high levels of performance for those business critical applications that require it. Not a new concept, but one that is gaining more traction as network connectivity becomes integral to business critical processes.

Most large organisations now run their businesses across converged IP networks that carry voice and data between multiple sites. They use disparate sets of access technologies, fixed (both copper and fibre-based) and mobile, for a wide range of applications and services that demand different performance requirements. Entrusting multiple applications and services to IP networks and Ethernet technologies has made Quality of Service (QoS) issues more important for organisations. They look for service level guarantees to distinguish private networks from the public Internet, to counter common performance problems such as packet loss, downtime and latency. CoS is a way of setting parameters to ensure QoS is achieved.

**Class of Service just might all sound a bit obvious, so it's amazing that more organisations are not implementing a strategy.**

**Companies who have done so are reaping the benefits not just in improved application performance and reduced outages. They are also able to plan and implement change with greater confidence and less risk, and they can allocate future IT spend to the areas where it will deliver the greatest impact.**

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## Cloud computing and mobile solutions increase the need for more granular network management.

The first phase moves onsite infrastructure to a central business site (HQ or a data centre) and increasingly employs hosted models to deliver a range of applications. As the cloud matures, expect to see more businesses delivering IT back to the business as a service. The second development, the rise of mobile solutions, takes business processes outside traditional office walls, empowering employees with anytime anywhere access. Both depend on network connectivity and both benefit significantly from the application of CoS facilities.

## Businesses are increasingly network-centric, a trend that will only accelerate.

The use of voice over internal business networks, the adoption of Unified Communications and Collaboration (UC&C) tools, and the uptake in video conferencing in particular, will expose ill-prepared organisations and highlight the importance of network performance management and the need to implement a CoS strategy.

Many organisations already experience common pitfalls at the network level that undermine business performance:

- **Network imbalance** – less important traffic uses excessive bandwidth and network facilities, slowing down or even stopping the delivery of business critical traffic.
- **Excess bandwidth** – with poor performing applications the temptation is to throw more bandwidth at the problem, when simple CoS measures can provide a more cost-effective fix.
- **Not all traffic demands the same treatment** – despite some applications and services having a low-performance requirement, all data is given the same level of priority, undermining the efficiency of the network and hampering employee productivity.

Such pitfalls reflect a knowledge gap among many organisations – entirely understandable because the impact of emerging network technologies is hardly core to their business. Therefore, it is the role of the network service provider to use all of its expertise to alleviate the pain points. Working closely with customers, the service provider will help plan, prioritise and shape a CoS strategy. The endgame is to be able to move traffic across networks based on relative importance, with network switches transmitting the most important traffic first. But how do you get there?

# How to Plan a CoS Strategy

The starting point is to have converged IP infrastructure and consolidated networks that are centrally managed. With all the components running from a central control centre with a single view, you can work with your service provider to analyse the variables, capacity plan and optimise performance to maximise the efficiency of network traffic.

The fundamental building block for a CoS strategy is identifying high-priority and low-priority traffic. An application may be business critical but the demands it places on the network might make it low priority in terms of performance prioritisation.

## Examples of typical traffic:

- **Low priority** – email and web traffic that uses FTP and HTTP protocols are not impacted by network characteristics. Therefore, they can be assigned less bandwidth and made a lower priority even though they are used constantly and consistently across the enterprise.

- **High-priority** – Voice-over IP, video and transaction-based applications can be significantly affected by network characteristics, impeding the user experience. A business critical database running 24 hours a day might be a high priority and demand guaranteed network performance levels. A sales department with reps on the road wants anytime anywhere access to a CRM application, and because it's revenue generating it becomes a priority.

Supporting new cloud infrastructure increasingly comes into the equation. The same levels of analysis and capacity planning should be applied when connecting with a cloud provider, so hosted email would be considered less critical and a low priority on the network compared to a hosted PBX system that delivers voice and related unified communications facilities as a service.

To plan a CoS strategy, it's important to be aware of industry standards that affect how traffic is processed. The IP protocol that underpins converged voice and data networks offers Best Effort services as standard, which means traffic is processed as quickly as possible but there are no guarantees of quality or the time it will take it reach its destination.

To manage and prioritise traffic, there must be an awareness of the impact of network characteristics such as delay, jitter and packet loss on applications and services. The reason that email and web traffic require low priority status and voice demands high priority, is because the first is insensitive to these characteristics while the second is affected by them.

By marking each data packet for a particular CoS, traffic is forwarded across the network and routers with appropriate levels of prioritisation. There are ways of leveraging different network technologies to mark traffic as high, medium and standard priority, ensuring the end-to-end infrastructure treats it accordingly.  You can, for example, implement priority queuing, reducing the time that packets of data spend at routers where they are processed and transmitted or drop. Bottlenecks and slow response times become a thing of the past.

# Three-steps to CoS Benefits: Analyse, Shape, Optimise

## 1. Analyse the traffic profile

The process of working out what kind of connectivity and bandwidth an organisation needs is about matching technical requirements to the business need. A starting point is to identify applications that underpin business operations and identify issues that undermine their performance. What causes the bottlenecks and do they recur across the organisation? Do some sites have different critical applications that need special attention? Are some sites able to function with low priority applications?

## 2. Shape the network requirement

Working closely with your service provider and armed with their application analysis, you can begin to create effective CoS parameters, serving the needs of the business on a department-by-department or site-by-site basis. Or it may be about accommodating core applications that are business critical to the entire enterprise – an order-entry database, for example, that runs constantly and consistently. Either way, in conjunction with your network services provider, you shape the network requirement by determining which types of traffic can be treated the same. By grouping applications/services together that share the same characteristics – web and email, for example – it becomes easier to manage the traffic and maximise the way bandwidth is allotted.

## 3. Optimise network performance

A key benefit of building a network infrastructure that is centrally managed with CoS parameters is that it facilitates a process of continuous improvement. CoS implementation is not a one-off project. Having the ability to prioritise traffic and reduce bottlenecks, organisations can begin to optimise performance on a department-by-department, site-by-site basis. Adjust CoS parameters to accommodate the rollout of a new application or the opening of a new office, or avail of Network Optimisation Services from your service provider to take application performance to a whole other level.

# Reaping the Rewards of CoS

Not just a technical fix, there are tangible business benefits in making CoS integral to an organisation's network management processes.

## A unique network for unique requirements

No two businesses are exactly the same and neither are their network requirements. Different locations in a multi-site business might have a function that demands a very specific type of network support, or a niche industry may depend on a particular application that puts a strain on infrastructure – a transport and logistics company, for example, using a telemetry solution. CoS configurations can accommodate all variables.

## Pay the right price for the right service

A CoS strategy ensures that bandwidth is properly utilised and avoids the common pitfall of organisations overpaying for network infrastructure or underpaying, which inevitably leads to poorer network performance. With total visibility of the business and the ability to prioritise traffic for maximum efficiency, better value is guaranteed.

## Better network performance means greater productivity

As organisations become more network-centric, employees are increasingly dependent on applications and services to get their work done. The better these perform the more productive the user, whether they are working from home, the office or out on the road. CoS ensures a better user experience which means the business will get improved productivity from its people. At the same time, CoS supports the ever increasing need of the business to enhance the customer experience by being more responsive.

**Propelled by increased demand for voice, video, and other real-time or bandwidth-intensive business applications, such as instant chat or desktop video conferencing, the implementation of an end-to-end CoS strategy will address the network consistently across user devices from the LAN edge to the enterprise WAN edge.**

**Just some of the business benefits from a CoS implementation are: the ability to more intelligently address network capacity issues; consistent standards across the hardware and software infrastructures; decreased voice-application-related help desk calls; Fewer support problems with applications that have strict host-to-host latency requirements**

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## CoS as a Managed Network Service:

Requiring technical competencies and levels of expertise that are difficult and expensive to recruit in-house, network and communications infrastructure are frequently among the parts of a business that organisations consider for outsourcing and managed services.

At BT Ireland our Managed Network Service propositions are structured to facilitate a CoS strategy across any and all IP and ethernet wide area networks. Flexibility is a central pillar of our service provision as we work with clients to match a solution to their unique network requirements. Typically, a five-step engagement programme will cover the strategic recommendations of this white paper, from the planning stage through to on-going optimisation.

1. **In a pre-sales process we take time to understand our customer requirements and their specific business needs.**
2. **We introduce the customer to the variables around application/service traffic; how and where they are pertinent to their business and the CoS opportunity to be explored.**
3. **Bandwidth is ordered and CoS profiled to meet the defined business requirements. Our team will configure all applicable network components to meet CoS parameters that have been identified and agreed with our customers.**
4. **Following implementation and service acceptance by the customer, we provide in-life site-to-site managed IP and ethernet services.**
5. **On-going adjustments requested by the customer will ensure the network infrastructure is always optimised to meet the customer's evolving requirements.**


Bringing it all together

## Offices worldwide



Registered office: Grand Canal Plaza, Upper Grand Canal Street, Dublin 4. Registered in Ireland No. 141524


## Find out more about Class of Service

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