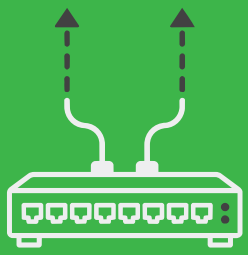
DUXNET

DuxNet Best Practice Guide to Uplink Planning & Capacity

DON'T UPGRADE THE PORT AND IGNORE THE PATH.



WHY UPLINK PLANNING MATTERS

As networks add multi-gigabit wireless access points, cameras, servers and other high-bandwidth devices, the uplink between the access and distribution layers becomes increasingly important.

An access-layer upgrade can therefore expose constraints elsewhere in the network.

Good uplink planning helps you:

- Match uplink capacity to expected traffic
- Identify potential bottlenecks before deployment
- Maintain usable capacity during a link failure
- Make provision for future network growth
- Confirm that the physical path supports the required uplink speed

Remember: Improving access speed is only useful if the infrastructure behind it can carry the additional traffic.

START WITH THE TRAFFIC

Uplink planning should begin with what the network is expected to carry. **Look at:**

Current utilisation
Use monitoring data to understand normal and peak traffic patterns.

High-bandwidth devices
Identify multi-gigabit APs, surveillance systems, servers, storage and other devices likely to generate significant traffic.

Traffic direction
Consider where the traffic is going. Large volumes moving towards servers, storage, internet connections or another network segment may concentrate on specific uplinks.

Expected growth
Allow for planned additions rather than designing only for the network as it exists today.

Port speed alone is not a measure of actual bandwidth demand. The objective is to understand how the connected environment uses the network.

UNDERSTAND OVERSUBSCRIPTION

The combined speed of every access port does not necessarily need to equal the uplink speed. Most networks rely on some level of oversubscription because all connected devices rarely transmit at maximum capacity at the same time.

The appropriate ratio depends on the environment.

A general office network may behave very differently from:

- A high-density wireless deployment
- A surveillance network
- A server or storage environment
- A network handling large media files
- An environment with frequent backups or replication

There is no single uplink ratio that suits every deployment.
Plan around the traffic profile, not simply the number printed on the switch ports.

PLAN FOR A FAILURE CONDITION

Redundant uplinks provide resilience, but they also affect capacity planning.

If two links are available during normal operation and one fails, the remaining path may suddenly have to carry considerably more traffic.

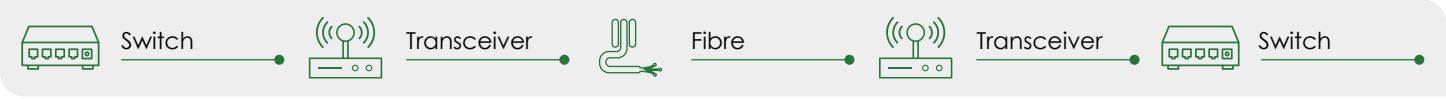
Before deployment, determine:

- What capacity is available during normal operation?
- What capacity remains if one uplink fails?
- Will critical applications still operate acceptably?
- Does the traffic automatically move onto the remaining path as intended?

A design should therefore be assessed under both normal and failure conditions. Redundancy is not only about keeping the link up. The remaining link must still be able to carry the required traffic.

CHECK THE PHYSICAL PATH BEFORE INCREASING SPEED

Moving from a 10Gbps uplink to 25Gbps or faster is not simply a switch configuration change. **The complete physical path must support the required speed:**



Check:

- Fibre type
- Link distance
- Existing patching
- Supported transceiver type
- Compatibility at both ends of the connection
- Maximum supported distance at the required speed

Older fibre infrastructure may have worked perfectly at the existing uplink speed but may impose limitations when the network is upgraded.
For detailed guidance on optic selection, refer to the DuxNet Best Practice Guide to SFP Selection & Compatibility rather than repeating the optic-selection information here.

THINK BEYOND THE ACCESS SWITCH

An uplink upgrade can simply move the bottleneck somewhere else. Follow the expected traffic path through the network and consider:

Distribution switching
Can the upstream switch handle the additional traffic?

Firewalls and routers
Do traffic eventually converge on a lower-capacity interface or appliance?

Servers and storage
Can the destination infrastructure receive the traffic at the required rate?

Internet connectivity
A faster internal network doesn't increase the capacity of the WAN/internet connection.

The network should be considered as a complete path rather than a collection of individual port speeds.

AGGREGATED UPLINKS

Using multiple physical links can provide additional capacity and resilience, but the design needs to be understood correctly.

Check that:

- All intended links are active
- The links are correctly configured as part of the aggregation
- Traffic is being distributed as expected
- The design behaves correctly if one member fails

Multiple links increase total available capacity, but a single traffic flow may not automatically use the combined bandwidth of every link.

PRE-DEPLOYMENT CHECKLIST

Before implementing the uplink:

- [ ] Review current and peak utilisation
- [ ] Identify high-bandwidth devices and applications
- [ ] Estimate expected network growth
- [ ] Determine acceptable oversubscription
- [ ] Check capacity during an uplink failure
- [ ] Verify the upstream network path
- [ ] Confirm fibre suitability for the required speed
- [ ] Confirm compatible transceivers at both ends
- [ ] Validate aggregated-link configuration where applicable
- [ ] Record the final uplink design

THINK BEYOND THE ACCESS SWITCH

1. Confirm the negotiated link speed
Make sure the uplink is operating at the intended speed.

2. Check interface statistics
Look for errors, drops and discards.

3. Review utilisation
Determine whether the problem coincides with high traffic levels.

4. Check aggregated links
Confirm that all expected members are operational.

5. Follow the traffic upstream
Check the next device in the path rather than assuming the access switch is the problem.

6. Test redundancy
Confirm that traffic moves correctly if one uplink is unavailable.

This section stays diagnostic — it does not re-explain fibre selection, capacity planning or oversubscription.

REALITY CHECK

A switch can have fast access ports and still deliver disappointing performance if the network behind those ports cannot carry the traffic.

Multi-gigabit access changes the capacity available at the edge.

Uplink planning makes sure the rest of the network is ready for it.

A FASTER ACCESS PORT SHOULD TRIGGER A LOOK UPSTREAM.

LET DUXNET HELP PLAN THE NETWORK BEHIND THE PORT

Duxbury Networking works with partners on switch selection, uplink planning, optics and network design. Engage the DuxNet team when planning network upgrades to ensure that improvements at the access layer are supported by the infrastructure behind them.

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