# IT Services

Technical Bulletin

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## On Boarding Ring Central

IT Services have concluded partner negotiations with Ring Central and are now a Wholesale partner

After several months of Negotiations IT services have signed a wholesale reseller agreement with Ring Central to build on our existing UCaaS and CCasS portfolio giving us options for new customers

The On Boarding process is fully underway with Sales, Design and Technical Training being completed. IT Services now have a Public Cloud UCaaS and CCaaS offering for our clients.

**See more details inside on Page 2**

## Fire Stopping Update

IT Services have successfully maintained our accreditation in Passive Fire Protection for penetration sealing with FIRAS (a UKAS approved scheme) This is facilitating our capability to work on key projects such as MOD WiFi. Well done to Al Wilson and the defence team in securing our status.

A comprehensive training programme is being completed across the defence team with ASFP to ensure we can deliver to a wider customer base moving forwards.

## Innovation Channel

I believe Innovation is a key criteria in the development and growth of any "Tech" organisation. Innovation comes from within and I would like to encourage everyone in the business to contribute to our development.

Please contact me direct or outline any ideas you have to develop the business with technical innovation or development ideas onto the following link:

**INNOVATION@NGBAILEY.CO.UK**

**Quick Update – CPR Regulations 'product selection' overview.**

**Find the latest on CPR on Page 3.**


## Our UCaaS Partners:

**IT Services work with a Number of partners to be able to deliver a flexible and agile service offering.**

Not all customers require the same features or have the same budget and it's important to have solutions that ensures we can provide our customers with options.

Our Key UCaaS partners are:

**Public Cloud:**

Gamma RingCentral

**Hybrid and Private Cloud:**

Mitel Powering connections NODE4 PXC

**Private Cloud:**

NODE4

**On Premise:**

Mitel Powering connections PXC

## What is UCasS or Unified Communication as a Service?

**A Unified Communications platform provides a single interface using either a Web Browser or a Vendor Application as an interface to multiple media communications.**

The service can be accessed via multiple devices that can support the browser or vendor application such as Laptops, PCs, Mobile Telephones, Tablets etc.

The types of media interaction supported via that application or web browser would be 'Chat', 'Instant Messaging', 'Email', 'Video', 'Phone Calls', 'Voicemail', 'File Sharing' and 'Calendar'.

A powerful feature of a UCaaS platform is 'Presence', it is easy to see a person's availability from within multiple media sources and to therefore interact in the most effective way.

All of the features within the service are delivered from the single vendors solution, however not all features will always be utilised by the customer and integration is available into other platforms for Email as an example.

A UCasS platform can be provisioned in a number of ways such as 'Public Cloud' via partners such as Ring Central or Gamma, 'Private Cloud' hosted within the NG Bailey Cloud platform, 'Hybrid Cloud' where the customer retains some of their core infrastructure buts hosts other elements in the cloud or 'Community Cloud' where multiple organisations (generally Public sector organisations in similar verticals and geography such as NHS or Local Government) share the same cloud platform to generate efficiencies. These solutions can also be deployed as 'On Premise' solutions where the infrastructure and software reside on the customers premises.

NG Bailey is partnering with a number of key vendors which has built our portfolio of services to be flexible and agile and provide customers with a range of solutions and options to meet their strategic goals.

## CPR Refresh – Construction Products Regulation

Our business has been aware of the requirement to design structured cabling solutions within the parameters of CPR for many years, however it is sometimes important to just refresh our understanding and the business position.

As part of any fire safety scheme we would always work within the overall construction main contractors design but reserve our position as an organisation to always provide products that we believe are correct for the purpose.

We would always install the correct fire rated fixing for any cabling supports and would always mandate in any response that our Structured Cabling products will always meet a Cca rating.

The industry has moved towards this and often the economic cable is a B2ca but we must adhere to our basic rules.

## CPR Classifications

IT Services have defined the cabling classicisation's within the Construction Product Regulations for fire safety.

Remember that NG Bailey will only ever design solutions or propose to install data cable with a "Cca" rating as a minimum

We should look to provision at B2ca as a default and anything that falls below Cca needs to be authorised by the Technical Director

| Reaction to Fire BS EN ISO 1716 | | FSC Comment |
|---|---|---|
| $A_{ca}$ | Does not contribute to the fire | It will be almost impossible for a cable to meet Class Aca and due to availability, they should only be specified with extreme caution. |
| **Reaction to Fire BS EN 50399** | | |
| $B1_{ca}$ | Minimum contribution to the fire | It's very unlikely that commonly-used cables will be classified to Class B1ca. |
| $B2_{ca}$ | Combustible, low flame spread & heat release contribution to the fire | Similar to Class Cca although a lower acceptable heat release rate and burn measurement. In practice, this is likely to be the highest class cables will meet. |
| $C_{ca}$ | Combustible, moderate flame spread & heat release | A more rigorous test than Class Dca this is widely accepted across Europe as the 'go to' classification, but be aware, many cables do not meet Class Cca though availability is improving. |
| $D_{ca}$ | Combustible, moderate flame spread & high levels of heat generated | This classification has relatively little use or acceptance within specifying/ contracting organisations. This is because no large scale fire growth is measured. |
| **Reaction to Fire BS EN 60332-1-2** | | |
| $E_{ca}$ | Combustible, limited fire spread of less than 425mm | A basic test for vertical flame propagation for a single insulated wire or cable using a 1-kW pre-mixed flame. Note: This test does not measure heat release, toxic fumes or smoke. |
| $F_{ca}$ | Combustible, fire spread of more than 425mm | Cables classified to Class Fca may have high levels of flammability due to the materials they are made of. This does not mean that the cable can not be used, it is more likely to be used in external |

Additional Classifications for Euroclasses B to D

| Smoke Production BS EN 50399/BS EN 61034-2 | Flaming Droplets BS EN 50399 | Smoke Acidity BS EN 60754-2 |
|---|---|---|
| **s1a:** s1 + transmittance >=80% (BS EN 61034-2) | **d0:** No fall of droplets or flaming particles, timed for 1200 seconds | **a1:** - Very low acidity (conductivity <2.5 µS/mm & pH >4.3) |
| **s1b:** s1 + transmittance >=60% <80% (BS EN 61034-2) | **d1 :** Fall of droplets or flaming particles that persist for less than 10 seconds, timed for 1200 seconds | **a2:** Low acidity (conductivity <10 µS/mm & pH >4.3 |
| **s1:** Low production & slow propagation of smoke | **d2:** None of the above | **a3:** None of the above |
| **s2:** Intermediate production & propagation of smoke | | |
| **s3:** None of the above | | |

Classes A to E have to be tested by an independent authorised laboratory. Most cables will fall into classes B2ca to Eca. For a cable to meet Aca, B1ca, B2ca or Cca, there also needs to be regular on-going factory audits.

# Advising on the "Right" Structured Cabling Product

**There are a number of cables available on the market, but the common cables deployed are typically category 6 and category 6a copper cabling systems which support all field-based devices from a connectivity perspective with Category 6 having a data rate of up to 1 Gigabit and Category 6a up to a data rate of 10 Gigabit.**

**Other cables that are available but less commonly deployed for end user devices are Category 7 and Category 8 which have data rates supporting 25 Gigabit, 40 Gigabit and up to 100 Gigabit but to a very limited distance of the 90-metre channel (between 15 and 24 metres typically) at those rates.**

A bit of history, Category 7 was developed as the next generation to Category 6 but had "Terra Connectors" not RJ45 and special converters had to be used to allow connectivity to switches and end devices. This did not prove to be practical and often Category 7 was terminated onto Category 6 and Category 6a patch panels, data modules and connector plugs but this effectively downgraded the product to a category 6 or Category 6a product.

The Category 6a cable was then developed to allow the use of RJ45 but with the added benefit of connections up to 10 Gigabit (which is more than suitable for end devices).

The Category 8 cable was developed to be a true next generation cable supporting the next level of data connectivity using RJ45 connectors, but this performance is limited to short distances, and anything connected over 24 metres will typically be running at 10 Gigabit. This cable is best utilised in Data Centre Applications for bespoke high bandwidth applications such as MRI scanners etc.

The Standards based bodies such as the TIA, ETSI, BS and EN all recommend that category 6a is the cable of choice for all horizontal cabling for all end devices including CCTV, Laptops, WiFi and general devices such as routers and local servers.

The cable operates at difference frequencies and can support data rates because of that, typically:

**Cat 6A = 500MHz**
**Cat 7 = 600/1000MHz**
**Cat 8 = 2000MHZ**

Category 7 is mostly deployed around certain European countries such as Germany and is not regarded within the industry as a viable product due to the connector issues with Category 8 being the recognised next generation from Category 6a.

## Shielding Considerations

For the purpose of this document, we are moving forwards with the consideration of Category 6a or Category 8, Category 7 would need to be terminated onto a Category 6a solution to allow interconnectivity with switches and end devices effectively reducing the system to Category 6a.

For high RFI (Radio Frequency Interference) and high EMI (Electromagnetic Interference) environments then Category 8 is only available as a shielded solution and Category 6a can be either unshielded or shielded and for retail and distribution environments we would recommend that a Category 6a cable be of a construction of Cat 6a F/FTP.

## Connector and Termination Considerations

Category 6a and Category 8 cables terminate using RJ45 connectors where Cat 7 (Or true Cat 7) use Terra-Connector's that need adaptors.

From a practicality perspective this would rule out Category 7 and to terminate onto Category 6a products would downgrade the performance of the product.

## Practical / Installation Considerations

- A category 6a cable is typically 7mm and a Category 8 is 8.2mm.
- A Category 6a cabling system is the industry standard for the applications required by Tesco and there is a proliferation of experienced data engineers in the market for installation.
- Category 6a will be easier to terminate and test and easier to install.
- A Category 6a Cable is likely to be available in more advantageous Minimum Order Quantities and easier to handle on site.
- The containment required would need careful design and a category 8 cable is unlikely to fit into a back box easily or pull down a conduit easily and containment may need upgrading to accommodate Category 8.

## Power Over Ethernet Considerations

Both a Category 6a cable and a Category 8 will support the current POE++ standards and there is no advantage with a Category 8 cable. The only slight consideration would be the larger AWG of the Category 8 conductors which could support POE at a larger power consumption than 95 Watts but that would require active equipment to support that power uplift.

| Name | IEEE Standard | Power to Powered Device (PD) | Max. Power per Port | Energized Pairs | Supported Devices |
|---|---|---|---|---|---|
| **PoE** | IEEE 802.3af | 12.95 W | 15.4 W | 2-pair | Static surveillance cameras, VoIP phones, wireless access points |
| **PoE+** | IEEE 802.3at | 25.5 W | 30 W | 2-pair | PTZ cameras, video IP phones, alarm systems |
| **PoE++** | IEEE 802.3bt (Type 3) | 51 W | 60 W | 4-pair | Video conferencing equipment, multi-radio wireless access points |
| **PoE++** | IEEE 802.3bt (Type 4) | 71.3 W | 100 W | 4-pair | Laptops, flat screens |

1. IEEE 802.3bt PoE Type 1 *(15.4 Watts) formerly 802.3af*
2. IEEE 802.3bt PoE Type 2 *(30 Watts) formerly 802.3at*
3. IEEE 802.3bt PoE Type 3 *(60 Watts)*
4. IEEE 802.3bt PoE Type 4 *(90 Watts)*
5. Cisco UPoE *(60 Watts)*
6. Cisco UPoE+ *(90 Watts)*
7. Cisco Power over HDBaseT™ PoH *(95 Watts)*

# Twisted Pair – Which One?

**Twisted Pair has had a complex journey and picking the right cable is essential.**

Are we over-engineering or under-engineering?

We need to ensure that our choice is fit for purpose to satisfy the customer requirements and maintain work winning competitiveness.

The table below will help with your thought process.

Often the customer will have been advised on what they require, however we need to assess and advise and maximise our technical standing with the customer

## Twisted-Pair Migration Roadmap: RJ-45 Simplifies the Upgrade Path

| | 1G to 2.5G | 2.5G to 5G | 5G to 10G | 10G to 25G or 40G | |
|---|---|---|---|---|---|
| | 1G | 2.5G | 5G | 10G | 25G | 40G |
| Category | 5e / 6 | 5e / 6 | 6 | 6A | 8 | 8 |
| Maximum Bandwidth | 100 / 250MHz | ~200 / ~400MHz | ~400MHz | 500MHz | 2000MHz | 2000MHz |
| Max. Application Data Rate | 1000BASE-T | 2.5GBASE-T | 5GBASE-T | 10GBASE-T | 25GBASE-T | 40GBASE-T |
| Max. Reach | 100m | 100m | At Least 100m | 100m | 30m | 30m |
| # of Connectors in Channel | 4 | 4 | 4 | 4 | 2 | 2 |
| Cable Construction | Unshielded or Shielded | Unshielded or Shielded | Unshielded or Shielded | Unshielded or Shielded | Shielded | Shielded |
| Date Created | 1999 | 2016 EST | 2016 EST | 2006 | 2016 EST | 2016 EST |