Next Generation Broadband Services

Introd'n for Building Owners on the Next Generation Broadband Systems Deployment Code C658:2018

April 2018

Communications Alliance

Outline:

- Background, Applicability and Overall Objectives

- Implications for Building Owners

- Network Architecture

- Process Timeline for Cooperation on Broadband Systems

- Example Scenarios

Background 1 of 2

- Communications Alliance has published rules to manage interference between competing broadband systems
  - Crosstalk interference occurs between broadband services using telephone wires.
  - Interference can occur between services connected to the same provider's system or between different providers' systems.
  - There are different ways that interference may be managed e.g. 'Vectoring' technology and managing Spectrum. The interference management rules developed by the committee balances these different approaches.
- There are other regulatory / legislative arrangements relevant to building access
  - Schedule 3 of the Telecommunications Act 1997.
  - Telecommunications (Low-Impact Facilities) Determination 1997.
    - The Department of Communications and the Arts is reviewing comments on suggested changes to both Schedule 3 and the Determination.
  - CA Building Access and Operations industry guideline (G571:2002)
    - Communications Alliance is revising G571.
  - **These arrangements are outside the terms of reference of the committee that created C658:2018, and are managed by different forums. This presentation does not address these arrangements.**

- Communications Alliance Working Committee 58 (WC58) work included:
  - Updating the Standard for DSL modems (AS/CA S043.2) to include Vectored VDSL2 (complete).
  - Creating an industry code of practice (C658:2018) – it applies to carriers and carriage service providers. (complete)
  - Developing a consistent format for recording information which needs to be kept by service providers about telecommunications systems in buildings, with the aim of simplifying coordination between competing providers.
  - Supporting material e.g. presentations like this.

- The draft Industry Code has Three Parts
  - Performance Requirements - objectives, terminology, processes for spectrum sharing.
  - Methods for Determining Compliance – technical details for spectrum management.
  - Requirements for Deployment Class Systems – the formal technical descriptions of systems that can be readily deployed.
  - The draft Code doesn't place obligations or requirements upon building owners and managers, but building owners and managers may be interested in the draft Code because the Code addresses interference between competing systems delivering broadband services into buildings.

C658:2018 Applies to (1.1,2.2/Pt1):

- Who: Carriers and Carriage Service Providers
- Where: Broadband Systems for Local Loop Services deployed or to be deployed from either a network cabinet (a "node") or from an access module installed in a multi-dwelling building or lateral development
  - Includes Network, Building and Campus systems
  - Includes Building and Campus legacy ADSL/ADSL2+ systems

- What: All Next Generation Broadband Systems deployed or to be deployed
  - Examples include VDSL2 (vectored and non-vectored) and G.Fast

- What: Shared Cable Bundles (2.2/Pt1)
  - Any grouping of twisted pair conductors where the proximity of the cable sheaths and/or conductors in the grouping has the potential to cause unacceptable Interference between them.
  - Includes separate cables that run together for part of route.
  - Excludes screened cable and exclusive customer (2.2 Pt1) cabling

The Industry Code C658:2018 has 5 Main Objectives (1.4/Pt1):

- to **facilitate competition** in the deployment of Next-Generation Broadband Systems (NGBS) by carriers and carriage service providers;
- to **minimise** the potential for **interference** between telecommunications systems deployed in the same Shared Cable Bundle;
- to **ensure** a minimum level of **performance** for certain next-generation broadband systems;
    - Minimum 25 Mbps download speed (the Communications Alliance Working Committee set this as the minimum for network and campus systems)
    - The Working Committee also set a 50 Mbps minimum for in-building systems
- to **protect** the performance of certain **legacy systems** (e.g. ADSL2+) while those systems are deployed in the same Shared Cable Bundle as a next-generation broadband system;
- to provide flexibility and scope for **technology upgrades** (e.g. G.Fast)

Implications for Property Owners and Managers 1 of 2

- Access under Schedule 3 of Telecommunications Act vs Property Rights
  - There are many potential locations where broadband systems may be deployed e.g. in street, in basement, on intermediate floors.
  - Space and electrical power may be required for equipment.
  - When co-locating competing broadband systems, the space available within and the arrangement of equipment in the equipment room can present difficulties that lead to interference.
  - Ideally, competing systems should be co-located closely next to one another to reduce risk of interference.

- Multiple Providers of Broadband Systems allowed by government policy
  - Government policy states a target for 100% achieving 25 Mbit/s and 90% achieving 50 Mbit/s.
  - If all broadband systems in a building can meet policy objective, then competing systems are allowed.
  - WC58 has identified combinations of competing broadband systems that can co-exist.
  - When vectoring technology has been deployed, the presence of more than one system affects the ability of vectoring to mitigate the effects of crosstalk interference.

- Register of Broadband Systems
  - To assist providers to discover and manage their own systems in the presence of competing broadband systems, WC58 proposed a register of systems.
  - It is in building owners' interest to ensure service providers maintain their respective registers.
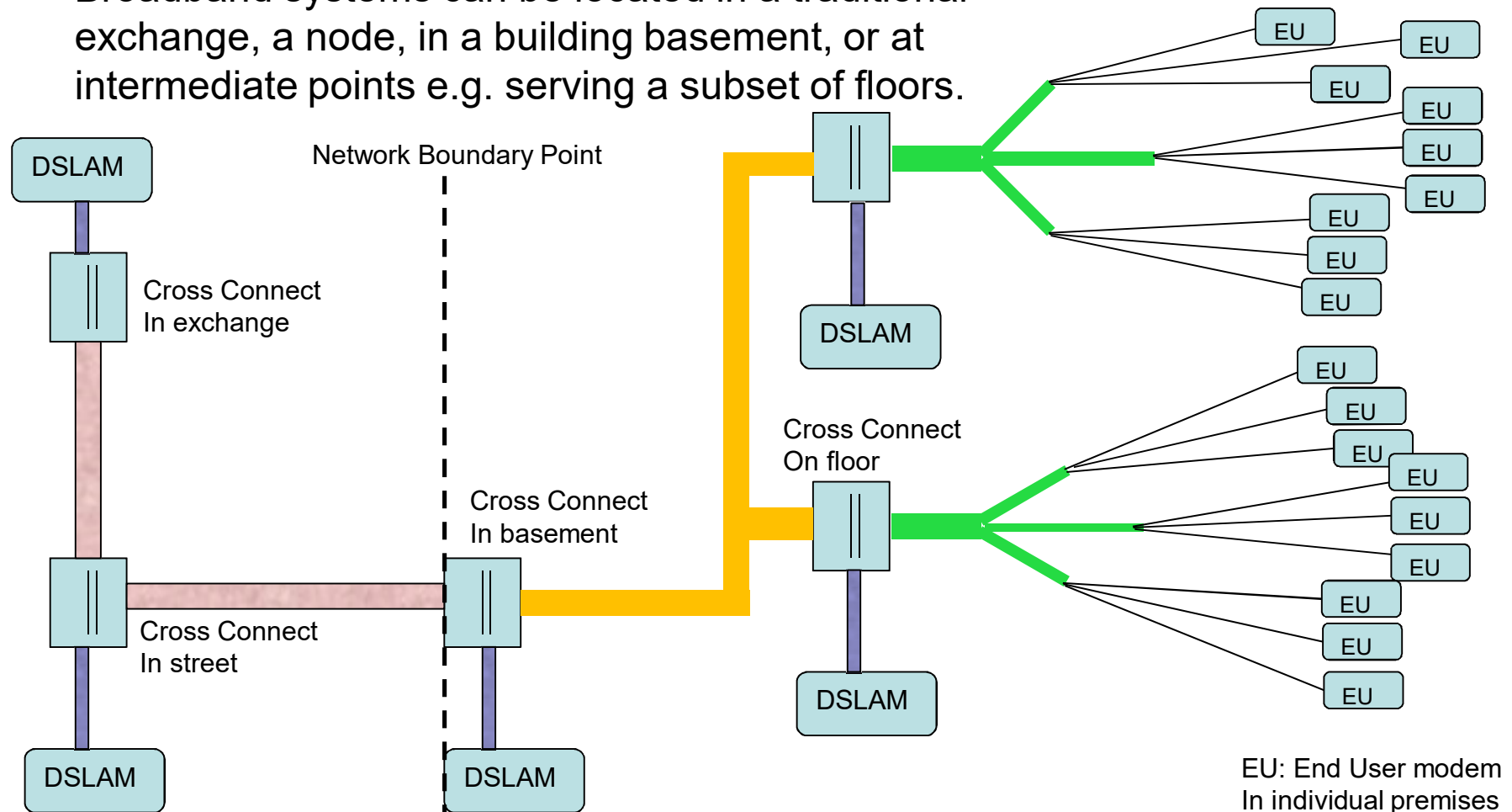
- Telecommunications Rooms in Buildings
    - Co-location of broadband systems is better for managing interference than locating the systems with physical separation of (eg.) tens to hundreds of metres.
    - When competing broadband systems are to be deployed, ideally they should be positioned side by side and configured with compatible settings to minimise the most harmful effects of interference.
    - Physical room size can limit or prevent installation of competing systems.
    - Telecommunications carriers and service providers need access to the telecommunications room for service provision, operation and maintenance.

- There are multiple stakeholders for operation of broadband systems, including:
    - Building owner
    - Building manager
    - End user (tenant / owner / resident)
    - Carriers and Carriage Service Providers

- Dispute resolution
    - The draft code includes processes for avoiding disputes between service providers.
    - Resolution of disputes between building owners and service providers is out of WC58 terms of reference.

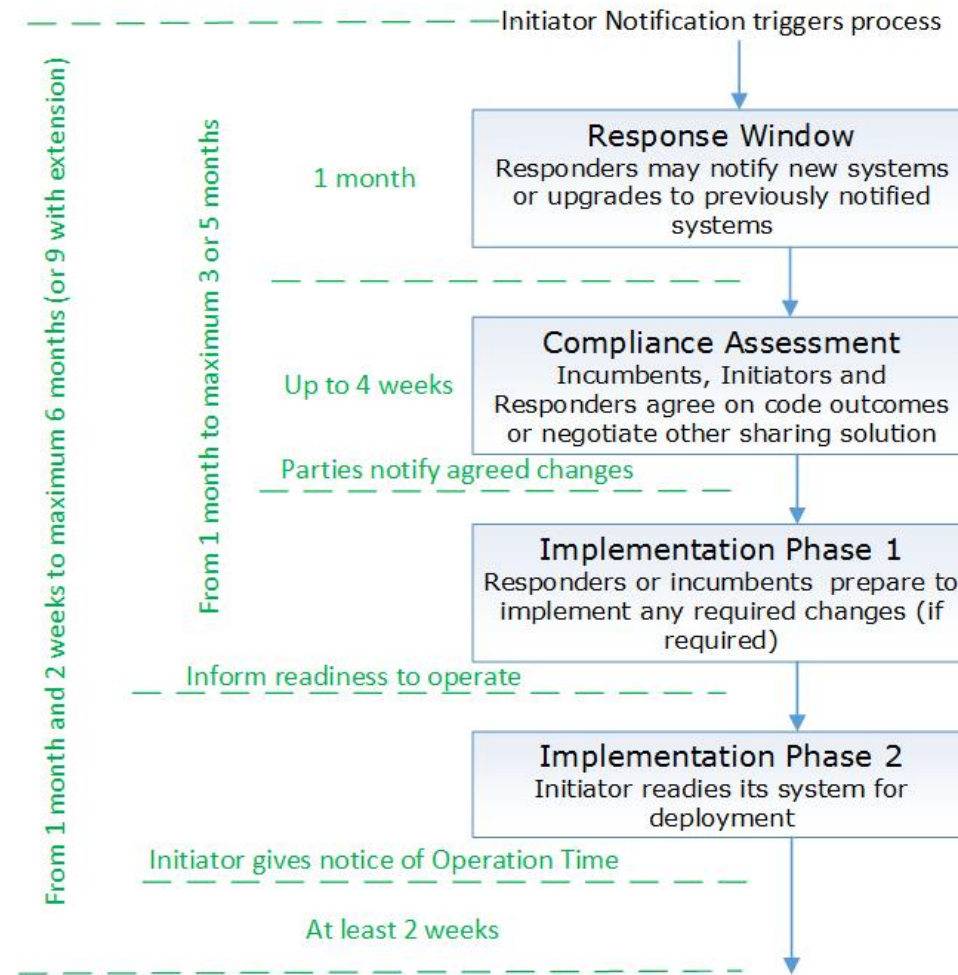# Broadband systems can occur at different points in a network

- Broadband systems can be located in a traditional exchange, a node, in a building basement, or at intermediate points e.g. serving a subset of floors.

Network Boundary Point

DSLAM

Cross Connect In exchange

Cross Connect In street

DSLAM

Cross Connect In basement

DSLAM

Cross Connect On floor

DSLAM

DSLAM

EU

EU: End User modem In individual premises

Cooperation Process Timeline
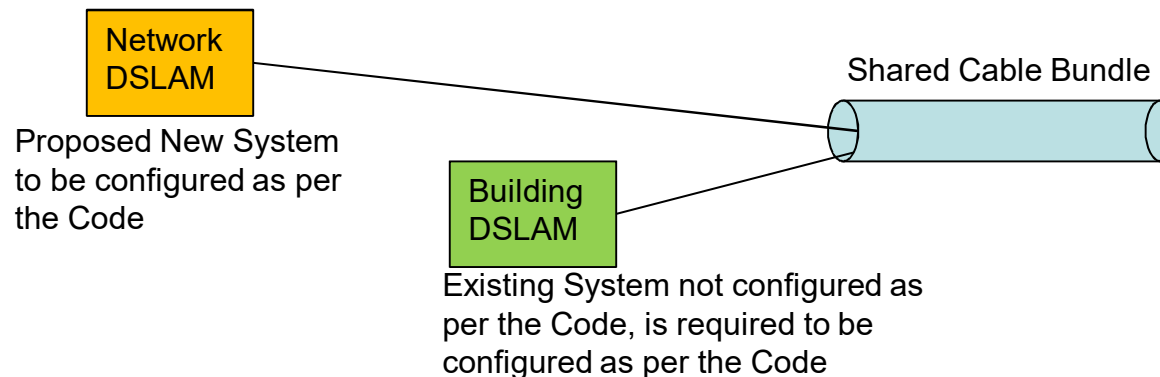
Scenario Examples:

- The Code allows for sharing solutions for many different scenarios

- The following three specific scenarios are merely illustrative of situations that may exist and some specific responses/outcomes to these situations
    - Note that the outcomes are not necessarily comprehensive and there may be other responses not described in the examples
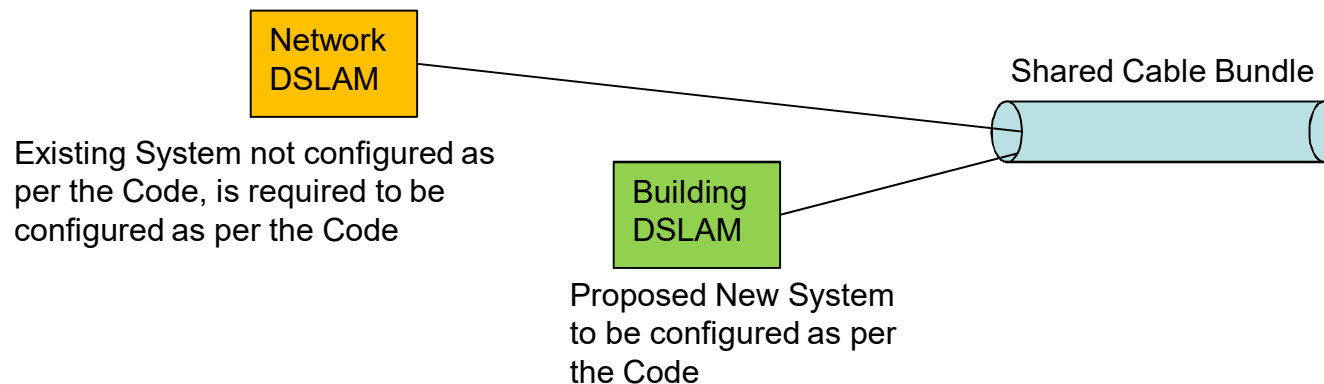
Scenario Example 1:

- Scenario: Existing, in-building VDSL2 system and a new network system proposed outside of the building

- One example of coexistence is:
    - the in-building system uses vectored VDSL2 on upper spectrum for VDSL2
    - and the out-of-building system uses VDSL2 on the lower spectrum for VDSL2

- The Code manages interference by requiring each system to avoid using the spectrum that the other system uses. The spectrum available to each individual system is less than it would be if there was only one system using the shared cable, and this means broadband rates may not be as high as if there was only one system. However this arrangement avoids direct interference between the systems, and vectoring technology is effective. Each system can achieve higher rates and fewer drop outs than it might otherwise achieve if spectrum was not managed.

Network DSLAM

Proposed New System to be configured as per the Code

Shared Cable Bundle

Building DSLAM

Existing System not configured as per the Code, is required to be configured as per the Code
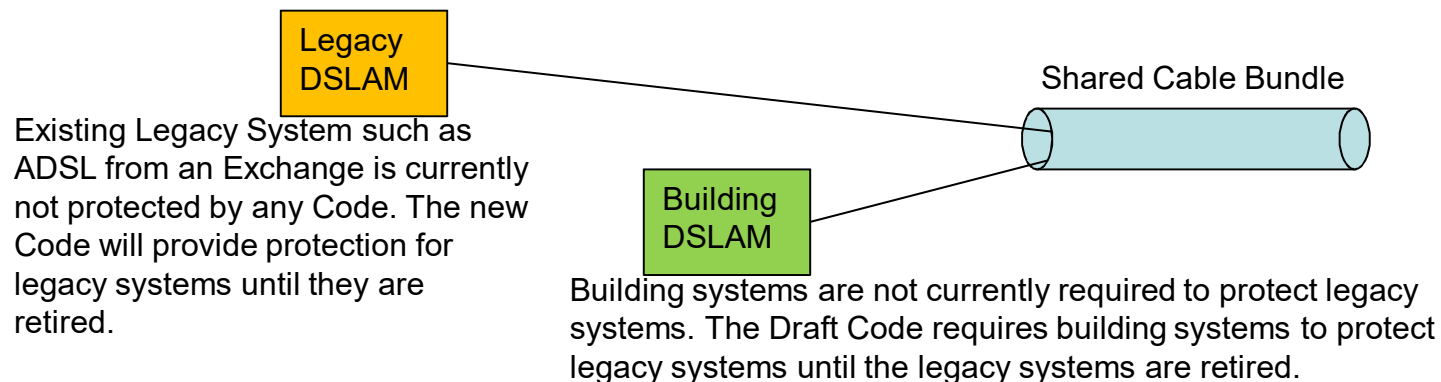
Scenario Example 2:

- Scenario: Existing, out-of-building vectored VDSL2 system and a proposed new in-building VDSL2 system

- One example of coexistence is:
  - the out-of-building system continues to use vectored VDSL2 of full VDSL2 spectrum
  - the in-building system has to change from VDSL2 to a different technology

  - The difference between the first scenario and this one is the order in which the systems are deployed. However the practical outcome for end users is effectively the same as with the first scenario.

Network DSLAM

Shared Cable Bundle

Existing System not configured as per the Code, is required to be configured as per the Code

Building DSLAM

Proposed New System to be configured as per the Code

Scenario Example 3:

- Scenario: Before the code comes into effect, existing, in-building VDSL2 system, and existing legacy ADSL2+ system at a 'traditional' exchange

- Likely Outcome:
  - In-building system already co-exists with legacy ADSL/ADSL2+ system
  - When legacy ADSL/ADSL2+ system is withdrawn, broadband rates may improve.

  - Exchange-fed broadband services may currently experience interference from building systems. The Draft Code introduces protection for exchange-fed services until the time those services are retired.

Legacy DSLAM

Shared Cable Bundle

Existing Legacy System such as ADSL from an Exchange is currently not protected by any Code. The new Code will provide protection for legacy systems until they are retired.

Building DSLAM

Building systems are not currently required to protect legacy systems. The Draft Code requires building systems to protect legacy systems until the legacy systems are retired.

Thank You