Australian National University

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Information Technology Services

Learning Space Technology (AV) Standards

Information Technology Services

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DOCUMENT CONTROL

Version	Date	Author	Amendment	Distribution
2.1	04/09/20	N Paterson	Update to current standard	
2.2	09/02/23	N. Paterson	Addition of meeting spaces	

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DOCUMENT OWNER

The technical content of this document is owned and controlled by Manager – Learning Systems Services - Information Technology Services

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1 PURPOSE

This document describes The Australian National University (ANU) Learning Space Technology (LST) Design Specifications (specifications). It is to be referenced whenever a space within ANU using LST devices is designed or modified.

These specifications are based on earlier versions of the LST Specifications that have been previously circulated. Feedback received on these larger documents indicated that a more streamlined form was required.

2 AUDIENCE

It is intended that this document be referenced by Audio Visual Architects, Designers, and implementers when planning, designing or constructing spaces that include Learning Space Technology devices to be installed across the ANU campus.

3 ASSOCIATED DOCUMENTS

This document should be read in conjunction with the following. Current versions of these documents are available at https://services.anu.edu.au/information-technology/audio-visual/av-specifications-guides-for-vendors

ANU LST Bill of Materials (BoM) - available at
https://services.anu.edu.au/information-technology/audio-visual/av-specifications-guides-for-vendors
ANU ITS Cabling Specifications - available at
https://services.anu.edu.au/information-technology/infrastructure/anu-cabling-specifications

4 INTRODUCTION

These Specifications are designed to provision consistent, robust and effective approaches to delivering a modern and professional face to all learning and teaching spaces, VIP meeting spaces and general meeting spaces.

The LST Specifications comprise three elements:

- Design Principles.
- End-User Experience.
- Technical Design and installation (including appendix).

These elements are supported by an approved Bill of Materials (BoM) listing the suite of products which are acceptable to ANU.

Adoption of these specifications will minimise noise, heat and physical barriers presented by traditional LST solutions and harness the enterprise proven systems within Information Technology (IT) Infrastructure and Application services to deliver a reliable, robust and responsive support model based on known and supportable solutions.

5 PRINCIPLES

The University LST design principles:

1. Designs must cater for a flexible and dynamic approach to learning and teaching spaces and bespoke teaching spaces utilising the building block approach as outlined in Appendix A.
2. Designs must reflect a best practice approach to the solutions within the modern-day learning spaces.
3. The meeting room design must utilize industry standard best practices and approaches to the solutions within today's modern and flexible meeting space.
4. All designs must adhere to the building code of Australia and be compliant with DDA regulations. This must include the WHS aspect of cabling across access and egress throughfares. Designs featuring trailing cabling across any type of flooring is not permitted. LST

equipment must be located external to the nominated space and utilise the Information Technology Networks communication spaces which are usually custom built to suit the equipment and provision cooling systems, airflow and security.

5. Designs must utilise Cloud technologies and On-premise solutions to deliver remote management, monitoring, maintenance harnessing streaming technologies and network switches.
6. Programming must be of an enterprise standard harnessing the network and switches to deliver control, audio and video.

6 END-USER EXPERIENCE

The goal is to balance the Pedagogy, Space and Technology, whilst meeting User Requirements. Designs developed in accordance with the specifications must consider user requirements and differing room configurations as being of prime importance, and deliver unity across the University rather than uniformity.

Meeting rooms which are to feature soft conferencing must be adequately fitted with acoustic treatment to ensure high speech intelligibility and speech privacy for both parties in a conference. Audio quality and speech intelligibility is an important aspect in a meeting room. Speech intelligibility Index (STI) should be above 0.6 and must be measured through STIPA with appropriate and acceptable ambient noise levels. Reverberation time must not be in excess of 0.2 to 0.5 (RT60) and all audio visual equipment must be rated to suit the requirements and size of the space.

Australian Standard AS/NZS 2107:2016, specifies room design for conferencing rooms and must be adhered to when designing room(s) with LST capability.

6.1 Flexibility

Learning and Teaching spaces must be flexible to cater for different teaching methodologies spanning didactic, active and reflective teaching methodologies. The focus is upon flexibility of space design, capacity and usage.

6.2 University-wide Consistency

The user interface and experience across teaching and meeting spaces must be consistent and standard across the University allowing academics and professional staff to use the systems with ease and confidence.

Touch panel layout must follow the ANU LST design standards and all programming must be of an enterprise standard utilising AV over IP solution for delivery of audio, video and control.

All equipment used must also be consistent allowing for familiarity of usage.

6.3 DDA Compliance

- Lecterns, Set-points and/or Control Stations must be fully compliant with the **Disability Discrimination Act (DDA).**
- All Lecterns, Set-points and Control Stations must be fully height adjustable.
- The options of physical barriers can be removed and alternative solutions can be implemented through the flexible design approach.
- All spaces must cater for Hearing Impairment where amplification exists, including the use of video conferencing and interactive boards.
- Where interactive boards are installed, these must be mounted on height adjustable stands or brackets to be DDA compliant.

Meeting room user interface equipment must be fully compliant with the Disability Discrimination Act (DDA).Cabling should be neat and tidy with no cabling across any type of flooring.

6.4 Remote Support Capability

Pro-active remote monitoring allows for regular electronic health checks of spaces and reduced time for problem resolution.

All LST and meeting spaces at ANU must utilize remote management, monitoring and support capabilities.

7 TECHNICAL DESIGN AND INSTALLATION

7.1 Network-Centric Model

All technical solutions must be based upon a network-centric model harnessing streaming technologies using multi-casting solutions with IGMP located at the Network Distribution level.

7.2 Power

All LST equipment must be powered by PoE, PoE+ or UPoE(+). There are to be no power packs installed in any system. Where this is not possible then an IP power board must be used as per the latest BoM, and prior approval sought from the ANU ITS AV Architect.

7.3 Management, Monitoring and Maintenance

- Creston's VC-4 and XIO Cloud is used for management, monitoring, maintenance, programming, and control of AV devices in the LST and meeting spaces. Meeting spaces can harness the benefits of 'Reflect' or other online monitoring tool which will fit into the management system utilised at the ANU.
- All designs must use Crestron's DM-NVX streaming solution, allowing for future expansion within the learning and teaching spaces. Meeting spaces should follow the QSC eco system as per the bill of materials.
- Each device in the LST system should connect to its own designated NVX device within learning and teaching spaces. Additional inputs on other devices in the system should not be used e.g. HDMI input on Air Media device.
- Q-Sys eco system will be utilized for meeting rooms at ANU. Q-Sys Reflect enterprise manager will be used for management, monitoring, maintenance of Meeting room devices.
- All designs in a meeting room would use Q-sys AV-over-IP solution for audio, video and control.

7.4 Design Deliverables

All designs should as a minimum, include (but not be limited to):

- User requirements documentation.
- Sight Lines based upon the ANSI/Infocomm/Avixa International standard – Display Image Size for 2D Content in Audio Visual Systems (DISCAS).
- Sight Coverage based upon DISCAS based on a 3% element height.
- Audio Coverage – Preferably in the format of ease modelling.
- Schematics showing in-room and Communication room solutions.
- Reflected Ceiling Plans of Electrical and Mechanical services.
- Rack layouts.
- Data and Power layouts, elevations, port counts and power estimations. Consideration should be made to the provision of data outlets and switch capacity.
- Recommendations for all infrastructure requirements should be made known at the earliest opportunity in the design phase of all projects.
- A Bill of Material based upon the latest approved BoM.

7.5 Bill of Materials

- External providers should consult the BoM on a regular basis. The version of the BoM is constantly changing due to changing technologies and our research and development into balancing pedagogy, space and technology. All external providers should quote the date and version of the BoM they have used to develop their design.

NOTE: It is the external providers' responsibility to contact the University for the current version of the BoM

- Any new equipment proposed that is not included in the BoM must be made available for on-campus evaluation by the University LST design team, allowing ample time for designs to be revised if necessary and approved.
- Any variations MUST be reviewed and approved by the University's ITS LST Architect.

7.6 Equipment Location

- No AV processors are to be located within the teaching spaces. The ANU is using Cloud-based control via Crestron VC-4 for learning and teaching spaces.
- All infrastructure equipment must be located in the designated communications room for the area (i.e. External from the Teaching or Meeting space).
- The equipment must be housed in 19" rack mount style Cabinets. Cabinet dimensions shall be 42RU or 45RU high, 900mm deep, and 800mm wide. Cabinets shall be complete with steel doors and side panels and vented top panel. Cabinets shall be approved by ITS.

7.7 Programming and Commissioning

- All programming for teaching spaces must be commissioned and made ready for production on a development server prior to submission.
- There must be no debugging or commissioning on the University's production environment.
- For meeting spaces there is a template design which only needs configured with the device details in the system. The template design shall not be altered by the integrator. The template design is available on award of any contract.

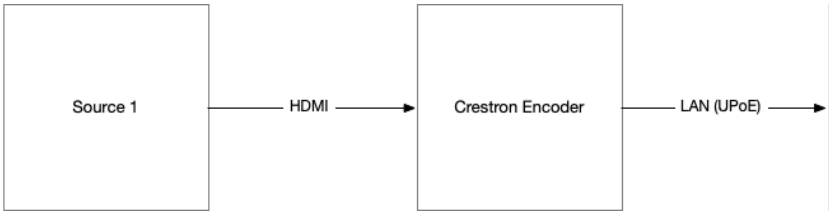
APPENDIX A. AUDIO VISUAL BUILDING BLOCK DIAGRAMS

Note: These examples are for guidance only and all designs shall be verified and approved by the ITS AV Architect.

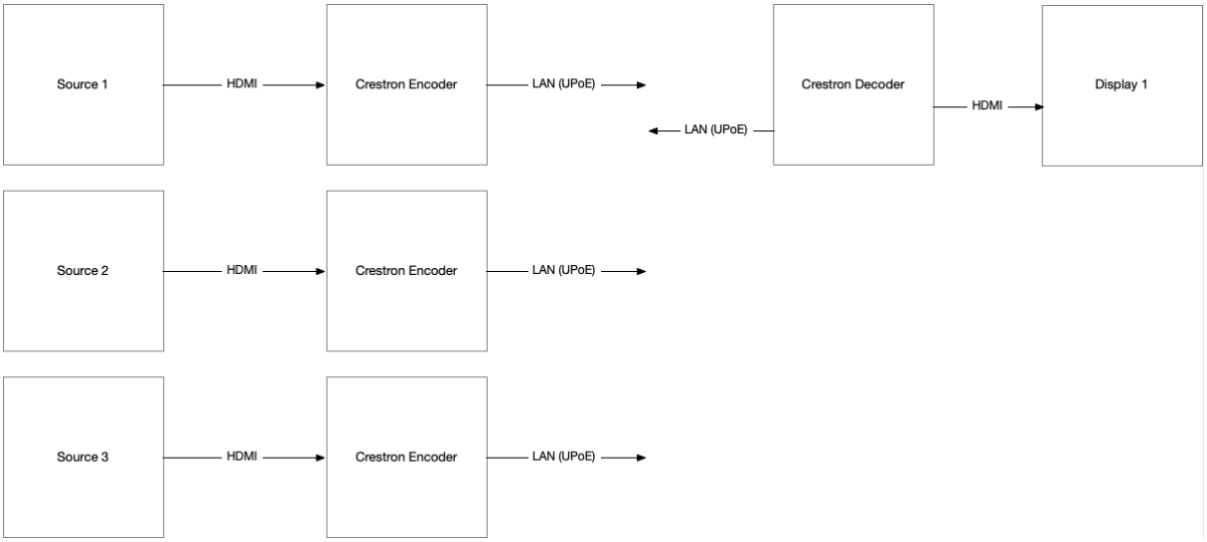
All devices must have their own encoder and no encoder should accommodate more than one device. This includes inputs on alternative sources such as an HDMI input on a Crestron Air Media. This kind of configuration will only be accepted in exceptional circumstances and must be approved by the ITS LST Architect.

If this is the case the touch panel admin page must have the ability to monitor the separate sources.

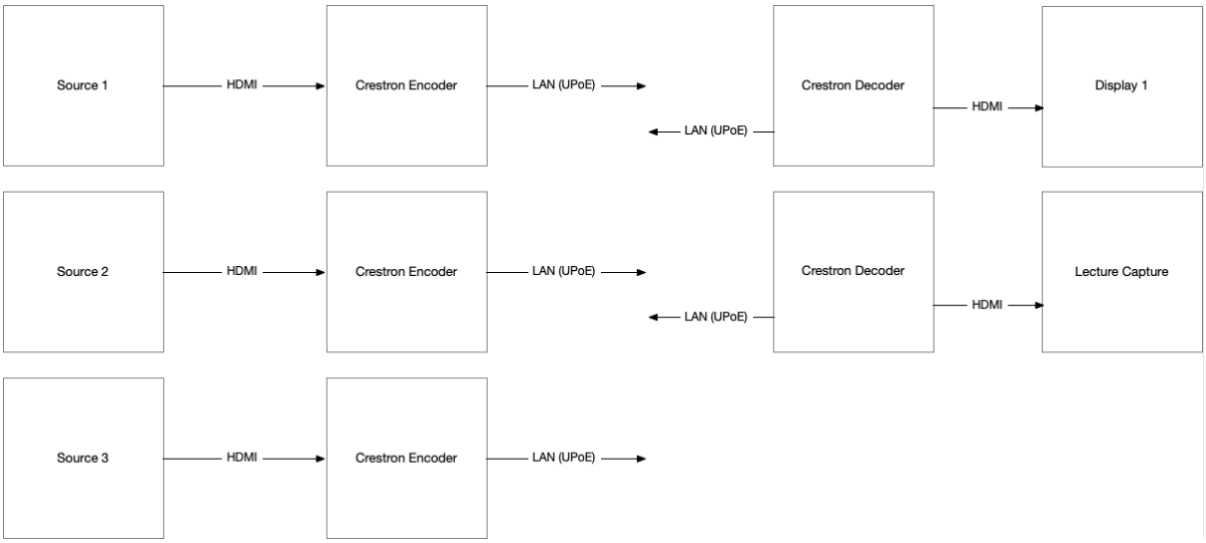
A.1 DEVICE INPUT: SINGLE SOURCE



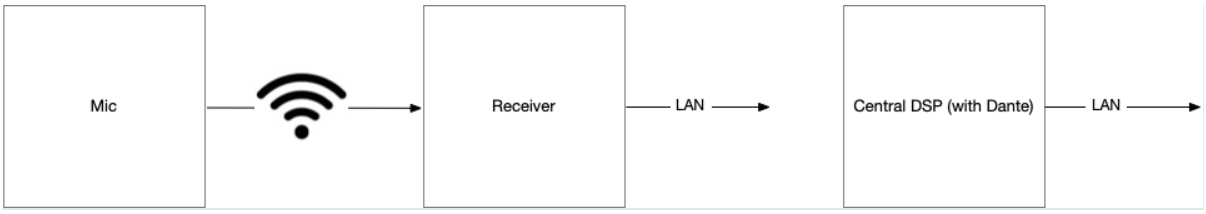
A.2 DEVICE INPUT: 2- 5 SOURCES (SINGLE DISPLAY)



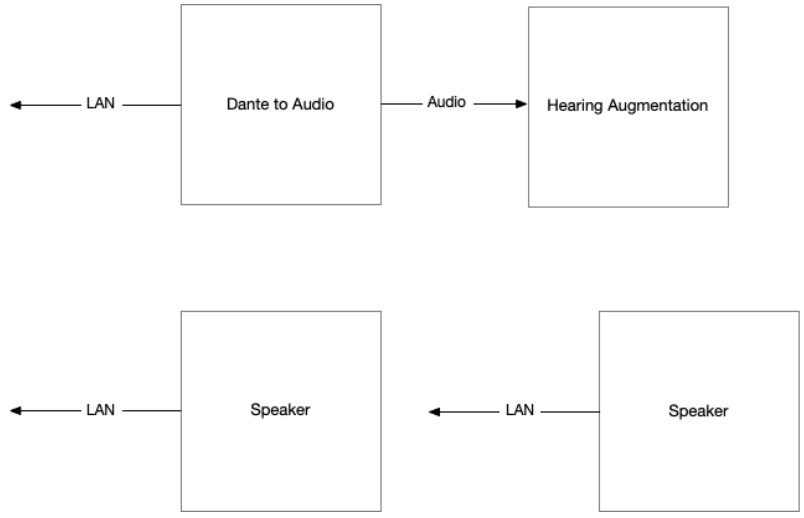
A.3 DEVICE INPUT: 2-5 SOURCES (SINGLE DISPLAY – INCL LECTURE CAPTURE)



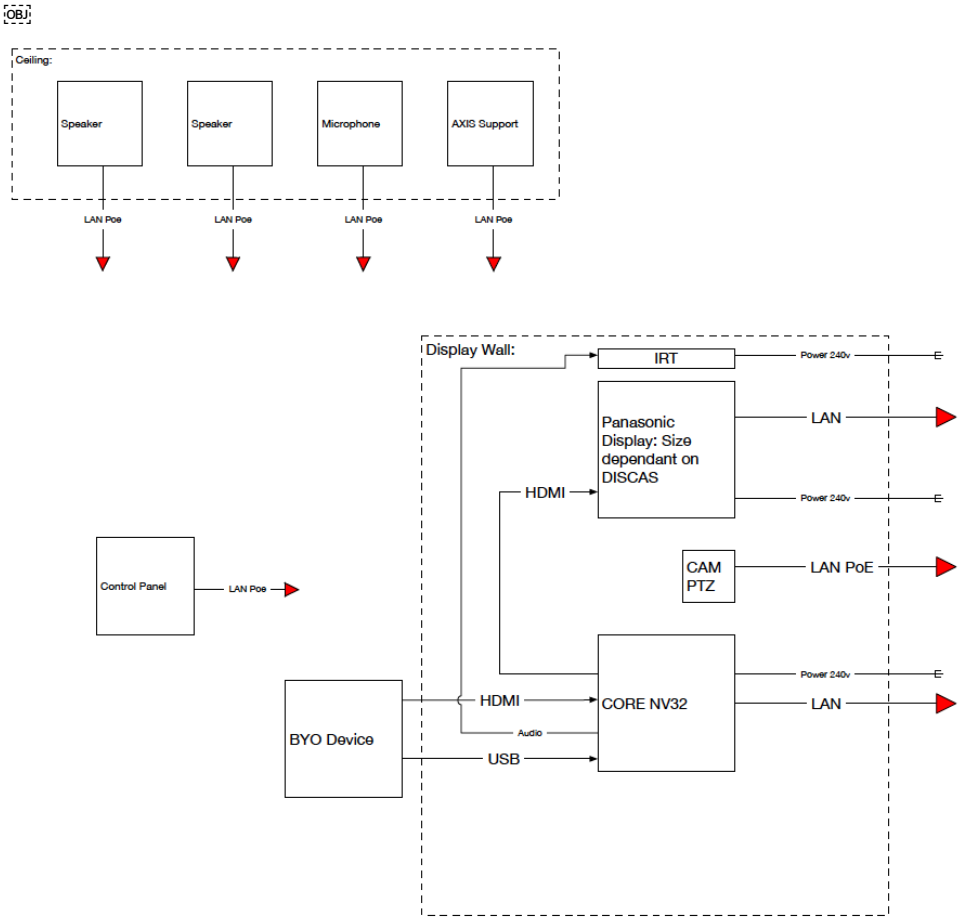
A.4 WIRELESS MICROPHONE AUDIO INPUT (DANTE – CENTRAL DSP)



A.5 DANTE AUDIO OUTPUT (INC HEARING AUGMENTATION)



A.6 MEETING ROOM



NOTES:
This template uses a building block approach. This current configuration is the minimum requirement for a small meeting space. Requirements will go dependant on the size of the meeting space. E.g. A larger room may require more speakers/microphones. A larger space will also require an upgrade of the camera to an optical PTZ (or two) depending on requirements.

Joinery TBC:
Bluegum joinery requirement dependant on room fabric and cable run/floor box availability.