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Multimedia and Networking

Anže Zadavec, Rok Žurbi

UL FE



UNIVERSITY OF LJUBLJANA
Faculty of Electrical Engineering



University of Pristina
Kosovska Mitrovica



Multimedia Equipment

- cameras (tracking options)
- projectors and projection screens
- conference and confidence displays
- microphones, speakers, headphones, speakerphones
- encoders and decoders
- software
- servers, storage and computers
- network routers, switches, access points
- controllers, sensors, actuators
- UPS
- mounts, stands, cables



Selection of Infrastructure Type

- traditional
 - analog and digital
 - HDMI, USB, BNC (SDI), XLR, jack, chinch ...
- new approaches & new opportunities
 - RJ45 (Ethernet)
- technologies and availability
- presence of infrastructure in many buildings



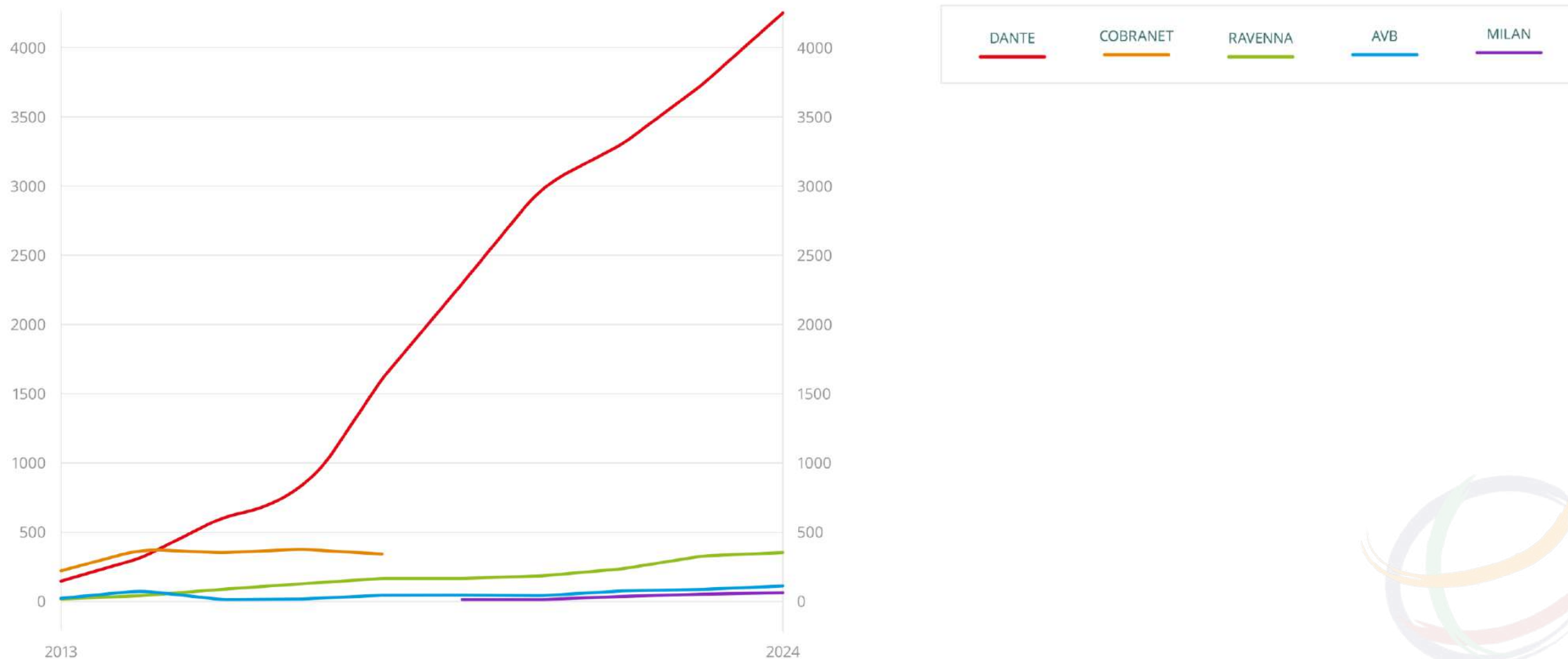
AV-over-IP

- “audiovisual over internet protocol”
- fast growth of available devices and companies offering devices
- plug and play in unmanaged networks
- speeds, latencies and jitters
- graphical interfaces for control and management (usually)

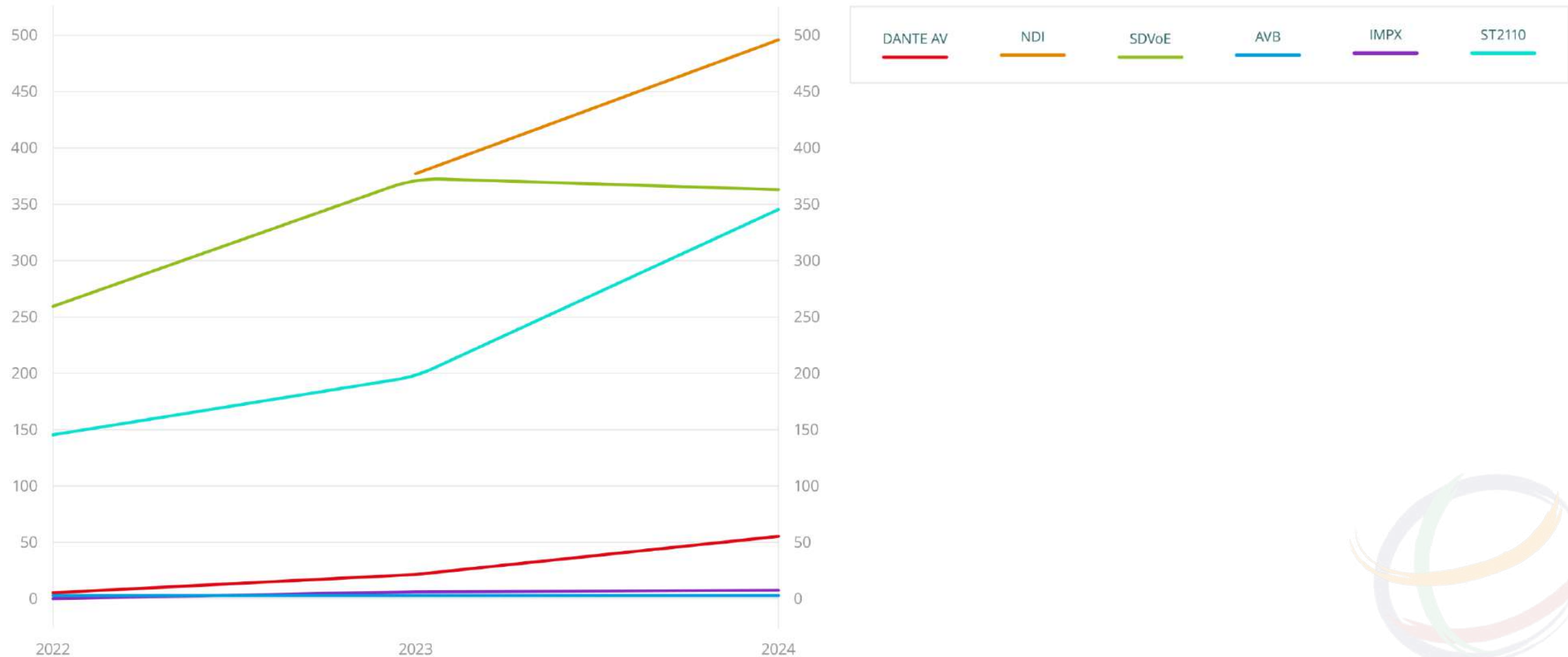
- most known protocols
 - Dante
 - NDI
 - SMPTE 2110



AV-over-IP (Audio Products)



AV-over-IP (Video Products)



Main Advantages

- possibility of smaller investment in infrastructure (current or upgrades/extensions, less specific cabling and devices)
- unification of management, measurements, provision, support ...
- greater flexibility of device positions (inside and between rooms)
- longer lengths of passive wiring
- possibility of power over the same cable (PoE)
- hardware matrices and signal splitters are no longer needed – simpler system extensions



Main Disadvantages

- a new concept of the meaning of physical connections and software configuration of signal routing between devices
- lack of knowledge of network protocols by technical staff (need for additional trainings)
- devices need (monthly) paid licenses or only approved chipsets
- troubleshooting problems due to improper implementation of protocols



Planning and Engineering

- selection ► installation ► configuration ► usage ► adjustments

- there is **no** universal equipment bundle ...

- resources

- purposes and needs
- room type
- existing equipment
- available staff

- budget

- equipment
- staff



UL FE – Purposes and Needs

- remote/hybrid meetings & live webinars
 - Zoom, Teams, BBB, Webex
- pre-recorded materials
 - OBS, Wirecast, DaVinci Resolve
- other services and platforms
 - Moodle LMS, ICT systems, schedules
- mandatory and optional equipment
- quality vs quantity



UL FE – Infrastructure

- modern network design
- convergence network for various technologies
- high speed uplinks
- user-managed network access
 - software defined access (SDA)
- unified management, network performance monitoring and troubleshooting
 - software defined network (SDN)



UL FE – Multimedia Rooms

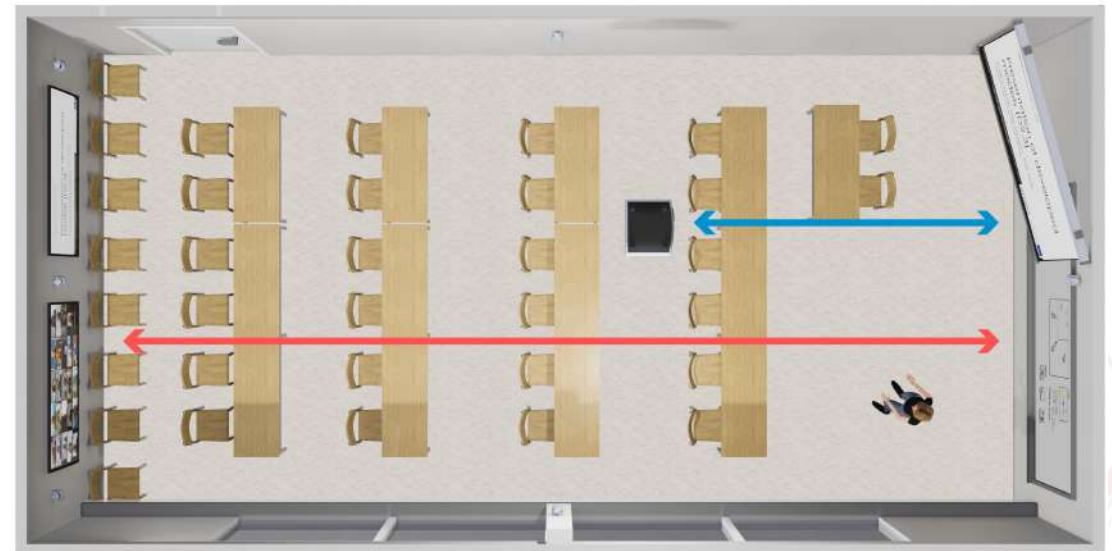
- various rooms
 - room types
 - room dimensions
 - seat layouts
 - lighting designs
 - micro locations of equipment
 - placement, heights, angles
- role models for future setups

minimum distance

1.5 × screen width

maximum distance

5.0 × screen width

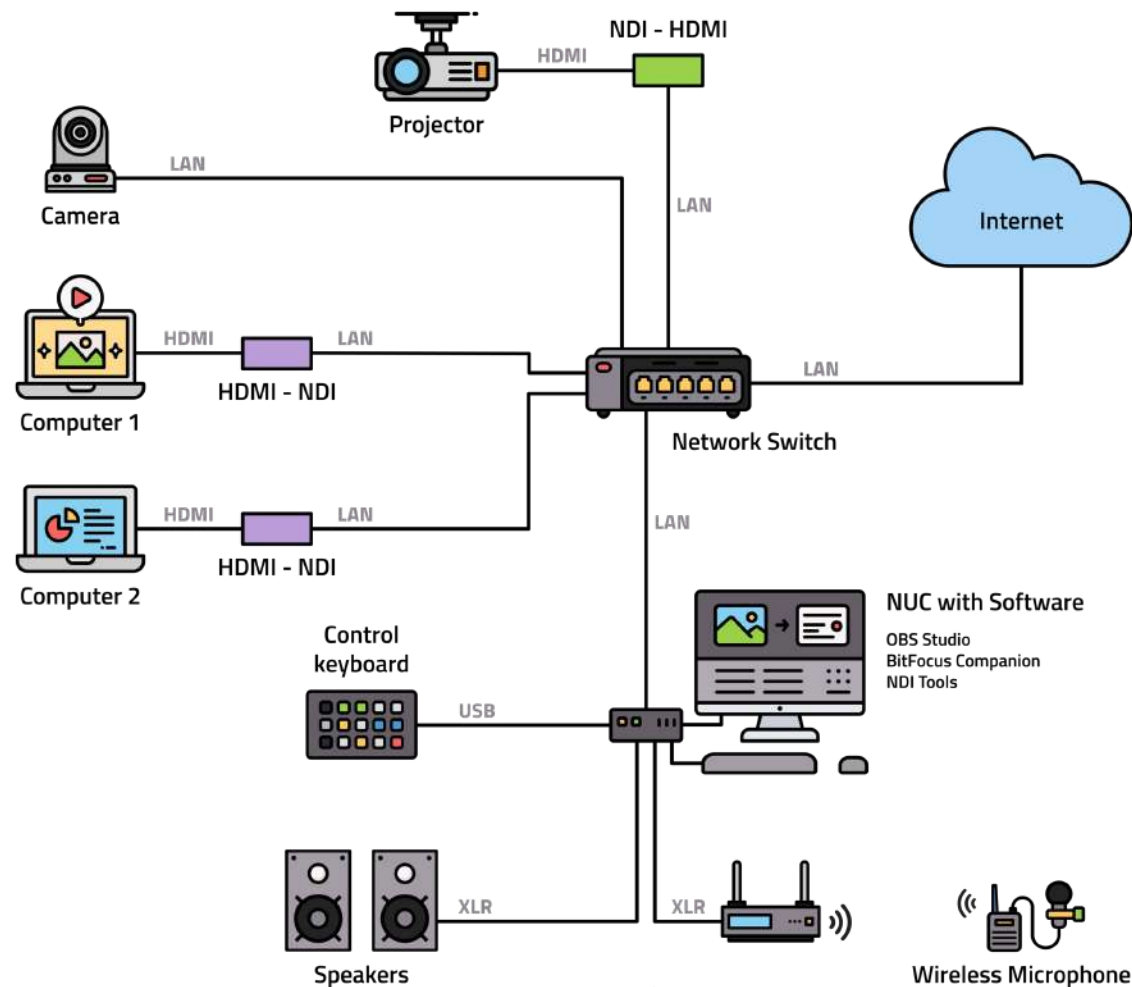


UL FE – Rooms Management

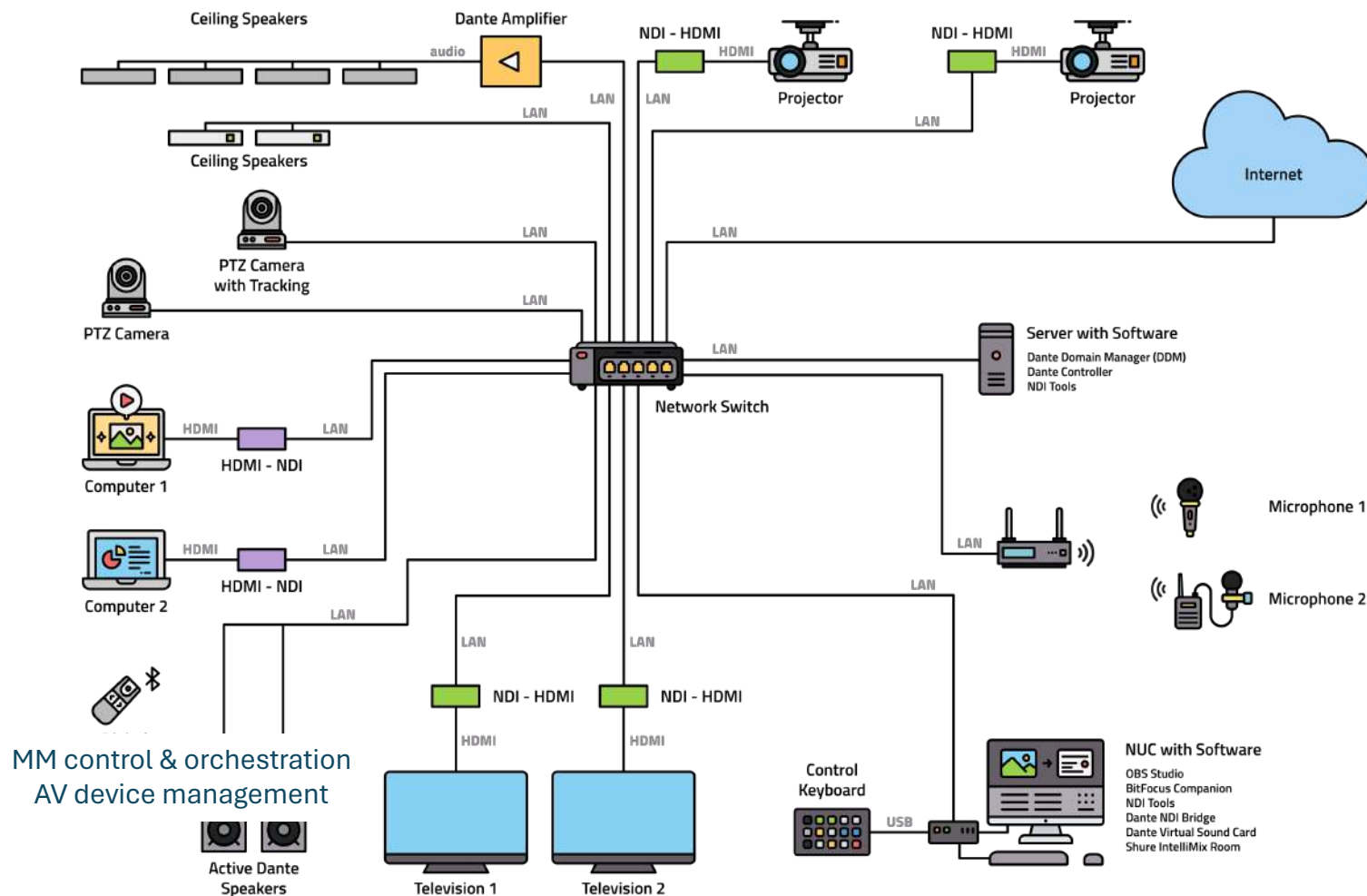
- user friendly approach
 - simplification
 - personalisation
 - automation
- integration of different equipment types
 - multimedia
 - shades
 - lighting
 - HVAC



UL FE – Simple Classroom

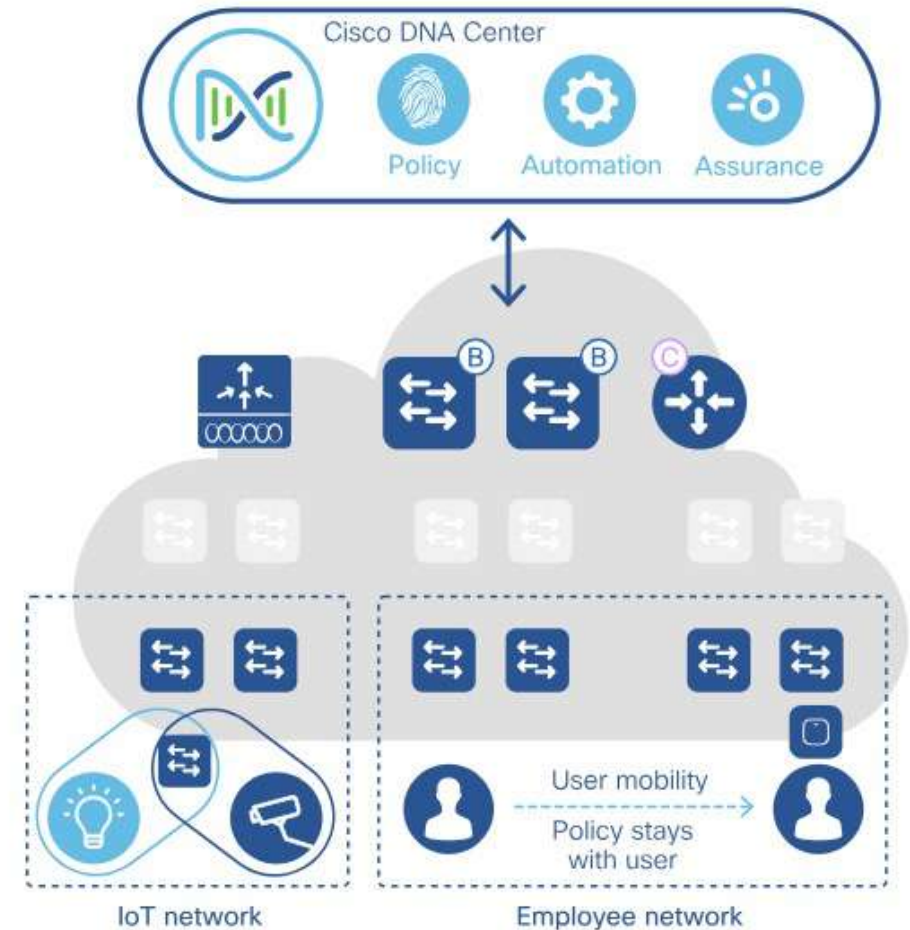


UL FE – Advanced Classroom

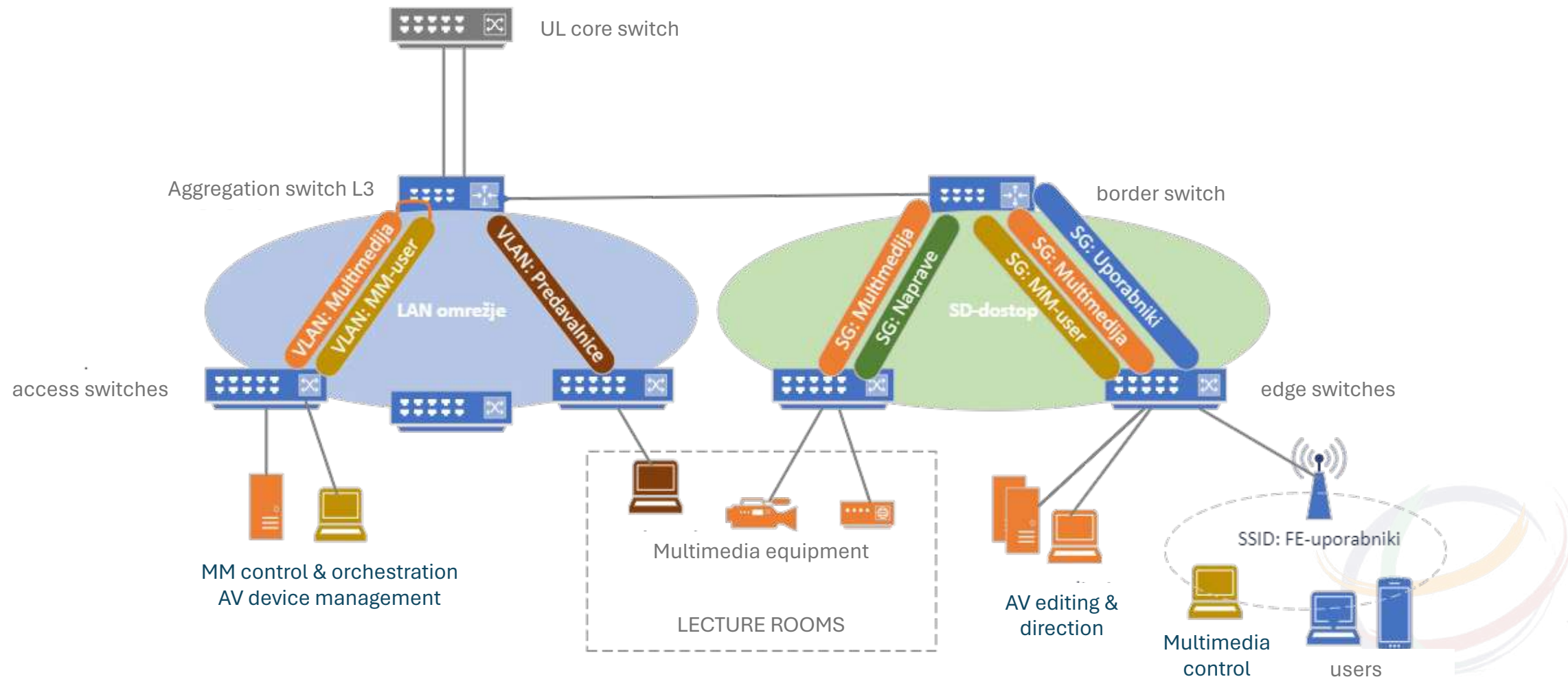


Network Design Considerations

- employees, students, IT, laboratories, HVAC, lecture rooms, video security
- converged services
- flexibility
- access control & security
- wireless access



UL FE – Multimedia Overlay



Hands-on Demonstration

Multimedia and Networking at UL FE

A decorative graphic at the bottom of the slide consisting of several thick, curved, overlapping brushstrokes in green, orange, red, and dark blue.



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Questions and Answers

"Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be."

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