



## International congress with 600 attendees and robust Wi-Fi coverage

### Singularity University (SU) Summit Europe

The Franz Liszt Academy of Music was the perfect host to leading global national defence experts, thanks to the D-Link Unified Wi-Fi system.



#### The D-Link Solution

##### Scalability

Due to central management the Wi-Fi network can be adjusted to specific requirements in a few minutes.

##### Separate internal and guest network

Separating the university and guest networks operating on one single infrastructure applying SSIDs and VLAN groups.

##### Load Balance

Clients are assigned to the APs automatically, thus downtime due to overloading can be eliminated.

##### Automated adjustment of signal strength

In case an AP fails, the system adjusts the signal strength of the neighbouring APs to guarantee full coverage.

#### The Event

Singularity University (SU) is based at the NASA Research Park in Silicon Valley.

Contrary to its name, Singularity University is not a traditional educational institute: it offers both postgraduate scholarships for young researchers and innovators from all corners of the world and also works with large companies (including Google, Genentech, etc.) to provide a platform for discussing the technological trends unfolding across the globe and their expected consequences.

In November 2013, instead of London, Paris or Berlin, the recently renovated historical building of the Franz Liszt Academy of Music served as the venue for Summit Europe, one of the key global forums on technology and the first European summit of its kind on exponential technologies hosted by Singularity University, established by NASA and Google.

The event was attended by the strategic directors and executive decision-makers of 600 large enterprises from the fields of finance, healthcare and education from more than 50 countries.

"I'm not exaggerating: it was fantastic seeing Singularity here. The entire weekend revolved around science and art, with a strong emphasis on the link between the past and the present." Botond Bognár – Summit Europe – Founding Director, Singularity University Summit Europe, Programme Director

*"It was a unique experience; the Academy of Music provided the perfect backdrop."*

Csaba Szabó – Summit Europe – Founding Director, Ambassador of Singularity University in Hungary

#### The Challenge

In line with the event's high technological profile, we needed to ensure cutting-edge technological solutions for event participants, organisers and the press.

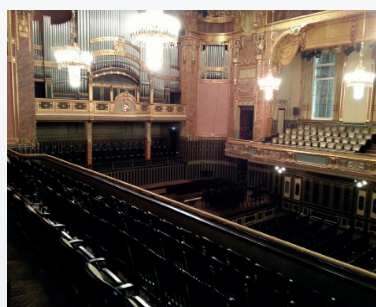
One of the key tasks was to deploy a Wi-Fi network providing continuous coverage without even the slightest interruption, able to accommodate a high load and providing maximum security.

Besides the large number of participants, the building's attributes (thick walls) and restrictions due to its listed status posed a challenge.

The management of the Franz Liszt Academy of Music opted for a permanent solution capable of meeting all the demands of hosting Summit Europe and also transforming the building into one of Europe's most highly-equipped venues from a technology point of view.

#### The main criteria were:

- Coverage for the entire building with a single, centrally managed Wi-Fi network
- Separate guest Wi-Fi network distinct from the university's internal Wi-Fi network but using the same infrastructure
- Malfunction-resilient solution capable of automatically managing the loss of individual radios, thereby ensuring a continuous Wi-Fi connection
- Simultaneous management of hundreds of continuously moving Wi-Fi clients
- Management of mainly mobile phone and tablet Wi-Fi clients
- Flexible scalability to meet the Wi-Fi demands of large-scale events at an affordable cost



### The solution

The management of the Franz Liszt Academy of Music opted for the D-Link Unified Wireless solution, which met all criteria and could be installed in a short amount of time thanks to the computer-assisted preliminary assessment, offering considerable savings over the alternatives.

The system's central element is the D-Link DWS-3160-24PC Layer 2 Unified Wireless Switch tasked with the management of Wi-Fi Access Points and which is integrated into the LAN, whilst also providing the power supply to the Access Points. Twenty DWL-6600AP Dual-Band Unified Wireless N Access Points were installed at the end-points.

Most of them were installed at their final location, with a few devices installed temporarily in high-traffic areas (atrium, main conference room).

"We used both bands of the dual-band devices. During the event, university staff required the usual wireless service, so we used the multiSSID function to provide 4 networks with different VLAN backgrounds and internet connections." - Sándor Kuti, Head of IT, Franz Liszt Academy of Music

DGS-1210-28P Smart Managed PoE switches ensure power supply for APs located further from the central switch.

### Advantages of the solution

D-Link Unified Wireless offers the advantage of high scalability and flexibility, able to accommodate the centralised management of up to 256 Access Points. Consequently, they opted for the DWS-3160 Unified Wireless Controllers which can accommodate the maximum of 192 Access Points approved by the Customer. The planned devices are all part of the fully-managed asset portfolio

#### DWS-3160 Unified Wireless Switch

1 RU target hardware-based solutions supplemented with the capacities of a Full Managed Layer2+ Gigabit Ethernet Switch. These controllers can be logically linked to allow the simultaneous centralised operation of 192 Access Points.

- 24 Gigabit port
- 802.11af / 802.11at PoE and PoE + support
- Unified Wireless — central management of up to 48 APs

#### DWL-6600AP Dual-Band Unified Wireless N Access Point

The biggest challenge when designing the system was to meet the contradicting needs of minimising storage requirements whilst maximising image quality:

- 802.11 a/b/g/n standard on both the 2.4GHz and 5GHz frequency bands
- Gigabit Ethernet port
- PoE support
- External antenna option

*D-Link Unified Access Points offer the advantage of being able to operate in stand-alone mode, in addition to centralised management. This serves redundancy and high availability in the following manner: In the scenario, APs operate in controller mode, supervised by the controllers and receiving all settings and parameters from them, with the controllers collecting and processing statistics.*

*However, if the connection between the controller and an AP is interrupted (controller error, network error, etc.), the AP switches to autonomous mode and continues operating as an autonomous AP using the previous settings. Clients are not affected by any interruptions. The SSID and access modes remain unaffected. This function can be used with maximum WPA2-PSK authentication.*

*Once the controller kicks in again, APs return to managed mode and continue in their "subordinated" role under the Wireless Controllers.*



**Key system functions:**

**Load Balancing**

D-Link Unified Wireless features Load Balancing, designed to distribute the load generated by clients among the available Access Points.

In practice, above a certain load, the controller does not allow any more clients to connect to the Access Point, “redirecting” the client connection requests to the closest available Access Point with similar transmission power.

Load distribution is pivotal due to the speeds ensured under the IEEE802.11n standard.

**Automatic power adjustment**

The main task of this function is to automatically and dynamically change the transmission power of every Access Point managed by each controller on the basis of the coverage ensured by the installed Access Points.

Where interference is a concern due to Access Points functioning at high transmission power levels, the controller can dynamically change their power to regulate interference.

The secondary task is to increase availability through the controller dynamically increasing the output of the nearby Access Points in case of any Access Point malfunction.

The system attempts to reduce the size of the area with no Wi-Fi coverage using this solution to the greatest possible extent.

This is why the maximum radio performance of devices was not taken into account when designing the system, leaving room for potential increases for the controller.

**Auto channel selection**

The function’s principal task after identifying environmental interference is to define the optimal channel selection for Access Points, taking into consideration the own channels of the Access Points managed by the controller.




The controller is capable of dynamically changing the channels of any Access Points affected by interference to mitigate the impact of the interfering factor as much as possible.

**Long-term prospects**

The Franz Liszt Academy of Music aims to become a key platform for cultural and academic life in both Hungary and Europe. A successful mix of the recently renovated historical building and cutting-edge technology provide the basis for this vision. An adequate Wi-Fi environment is an integral part of these foundations.

“Most of the system was installed permanently, and some of the Access Points can be placed in locations flexibly adapted to current needs. The Unified Wireless switch automatically integrates them into the system, applying the current optimal parameters.” — said Sándor Kuti, highlighting one of the main benefits of the system.

**The following products were installed as part of the system:**

 DWS-3160-24PC	24-Port Gigabit L2+ Unified PoE Managed Switch including 4 x Combo 1000BASE-T/SFP ports
 DWL-6600AP	Unified Wireless N Simultaneous Dual-Band PoE Access Point
 DGS-1210-28P	28-Port Gigabit PoE Smart+ Switch with 4 SFP ports

For more information: [www.dlink.com](http://www.dlink.com)