**ECH Scope of Work: network and IT**

1. Timelines

It is expected that all the network requirements, connection between venues and internet lines will be ready at least 6 days before the event starts. In fact, most suppliers will arrive 5 to 6 days before the event starts so they will expect all lines to be in place, tested and supported by the relevant contractors.

1. Internet Connection

Here are the separate internet connections which have to be provided in the stadium:

* Main Accreditation Centre -> 50Mbps
* Main Media Centre -> 200Mbps
* Written Press Tribune- > 200Mbps
* Commentary positions -> 200Mbps (can be combined with Written Press Tribune)
* TV Compound and IBC - > 200Mbps
* OVR (dedicated line, with a public IP) -> 50Mbps
* Hawkeye Operations Room (dedicated line) -> 50Mbps
* Each of the half-marathon/marathon split positions (20Mbps)

These lines excludes the telecommunications lines for the use of broadcast to send the TV signals as part of the EBU network.

1. VPN between venues

The various venues of the European Athletics Championships have to be interconnected to build a common network through the WAN.

The road venue(s) and the field event venue(s) have to be connected through a VPN.

The signals to go through this network are: Results network, CIS network, various TV graphics video signals (inc. running time graphics) if the production is done out of the main stadium production units.

The LOC has to be built, via its telecommunication partner/sponsor or as a service, a VPN between the main venue (stadium) and all the possible other venues. This(ese) VPN(s) has(have) to carry the VLANs from the stadium to the other respective venues. It has to be monitored and supported during the whole duration of the championships and be ready at least 6 days before the championships start.

This paragraph excludes the requirements from the Host Broadcaster to send the isolated camera signals, to be able to do the production remotely.

In order to properly carry the CIS signals between the venues, the VPN connection has to enable multicast data transmission.

1. VLANs

The following VLANS have to be created for the various partners:

* Atos:
	+ Results: it consists of the network connecting the data acquisition (Photo Finish Rom, VDM, TD room, Call Room, Victory Ceremony) as well as all the locations where a results printer or a results laptop is required (TIC, Media Centre, Flash Quote, Event Presentation, TV compound, TV graphics room)
	+ CIS-1 to cover the TV compound
	+ CIS-2 to cover the Media Tribune and Commentary positions
	+ CIS-3 to cover all other spaces, inc. Mixed Zone, offices, etc…
	+ Virtual graphics to cover specific camera positions and TV graphics room
	+ Isolynx to cover the Isolynx antennas and the timing room
	+ 1 spare

Results VLAN and the 3 CIS VLANs have to enable the multicast data transmission.

* Hawkeye
	+ 1 VLAN

1. LAN cabling
	1. Backbone cabling

The following long connections will have to be provided with adequate fibre optics cabling, as the distance will exceed 100m, between:

* OVR and Media Tribune/Commentary positions
* OVR and Mixed Zone
* OVR and TV Compound/TV graphics room
* OVR and VDM
* OVR and EP
* OVR and Call Room
* OVR and TIC
* HawkEye to TV Compound
* Timing room to Isolynx cameras
	1. Results

The Results VLAN has to be distributed to

* Photo Finish room (for the timing data)
* VDM location (for the measurement data)
* TV compound/IBC (for the delivery of the TV graphics)
* TD room (for results interface and printer)
* Victory Ceremony (for the presenter laptop and printer)
* TIC (for the results interface and printer)
* Call Room (for the entry laptop and printer)
* Media Centre (printer)
* Event Presentation (printer)
* Mixed Zone for Flash Quote (for Flash Quote laptop)
* Long Jump and Triple Jump ruler board (RJ-45 to be installed behind the advertising boards
	1. CIS

The CIS VLAN has to be distributed to

* TIC
* Call Room
* Media areas: Media Tribune/Commentary positions, TV compound/IBC, Mixed Zone (live and inside mixed zone for written , TV studios
* Areas around the mixed zone: flash quote and anti-doping notification
* Video recording room/Hawkeye
* Jury of appeal
* Offices: LOC, EA, TD room, ITO room, National official room
* Infield (next to each athlete bench)
* Victory Ceremony
* European Athletics club

The list of locations where CIS monitors are required is in Appendix 1

* 1. Virtual graphics

There are several cameras used for virtual graphics (Long Jump, triple Jump and long throws). Atos uses a tracking device for each of these cameras. These devices have to be connected to the Virtual graphics VLAN, so a network connection has to be provided for each of these cameras (exact location to be confirmed by the Host Broadcaster.

The same Virtual graphics VLAN has to be provided in the TV graphics room, as Atos subcontractor for virtual graphics processes the data provided by the tracking devices in the TV graphics room (most probably located in the TV compound).

* 1. Isolynx

Atos (via Matsport) uses the system Isolynx to track the athletes around the stadium. It consists of 4 antennas which need to be cabled from the timing room.

These antennas will be placed at the 4 corners of the stadium and the LOC has to provide a network connection at each of these locations and inside the timing room with the dedicated VLAN.

* 1. Hawkeye

HawkEye does the video recording during the event. They use a combination of their own cameras (up to 10) and a number of Host Broadcaster cameras.

The LOC has to provide a network connection, through a dedicated VLAN, from the HawkEye Operations Room to:

* Each of the Hawkeye cameras (up to 10) by fibre optics (4 core SC fibre)
* The HawkEye server placed in the TV compound (MCR - to be confirmed by HB - where the HB will deliver all camera feeds to the Hawkeye server) by fibre optics (4 core SC fibre)

In addition, the LOC will have to provide video cabling suitable for HD-SDI video, terminated by BNC connectors, between the HawkEye Operations Room and the Jury of Appeal. If necessary, these video signals will be converted into data signal to be transported by fibre optics cables.

1. Wi-Fi

The following areas have to be covered with a strong signal, where the Access Points will be located and configured to accommodate the number of users:

* Media tribune: 500 users
* Media centre: 500 users
* VIP: 500 users
* Broadcasters (HB+IB) in TV compound and IBC: 2000 users
* Teams: 2000 users
* Spectators area: 10,000 users
1. CATV

It is expected that the LOC will create and deliver the CATV signal throughout the venue.

* 1. CATV signal

The CATV signal is made of the individual isolated feeds produced by the Host Broadcaster, as well as any Information channel as decided by the LOC. The individual signals will be provided by the HB at the Master Control Room (MCR) and it is the responsibility of the LOC to multiplex them into one signal to be distributed through a RF or/and an IP network.

In the commentary positions, the delay between the live action and the images on the monitors provided should not exceed 1 second. The audiovisual industry standard recommends not to use an IP distribution network to be able to meet this delay requirement. Therefore, the LOC will distribute the signal in the commentary positions through coax cabling, with F-type antenna connectors with screw.

For the other part of the CATV network, the LOC may decide to run the signal on an IP network. Having 2 separate types of network can be a good solution to meet the strict requirements in the commentary positions, as well as using the existing LAN cabling within the venue.

* 1. Distribution of the CATV signal

The LOC will distribute the RF or IP network in the locations where a TV is necessary.

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| --- | --- | --- | --- | --- |
| *Location* | *TV 15”* | *TV medium* | *TV large* | *Type of signal* |
| Commentator position | 1 per pos. |  |  | RF |
| TV Compound/IBC | As per Rate Card bookings |
| EA Club |  |  | 3 | IP |
| Media Centre |  |  | 5 | IP |
| Photographers’ room |  |  | 2 | IP |
| Mixed Zone (Press and ENG) |  |  | 2 | IP |
| Anti-Doping Waiting Area |  |  | 2 | IP |
| EA Office |  |  | 1 | IP |
| HawkEye |  |  | 2 | RF |
| Jury of appeal |  |  | 1 | IP |
| Call Room |  |  | 2 | IP |
| TIC |  |  | 1 | IP |
| Etc… |  |  |  |  |

The LOC will install, connect, test and support the monitors in the tribune, as well as the distribution network.

1. Support, Maintenance and Supervision
	1. Network Monitoring

In order to supervise the whole network, a comprehensive monitoring is required. The monitoring should report the parameters of the network devices as well as the status of these devices. The routers, switches, access points and active equipment connected at each point of the network have to be supervised and tracked at any time during the event. If CISCO switches are used, the appropriate monitoring tool should be used, including the visual architecture of the network.

The tool used for monitoring can also send notifications for any change or reported issue on the network. In order to do that, the appropriate port security will be applied to every point of the network.

* 1. Technical Operation Centre

In order give the possibility for users to report any issue, a Helpdesk has to be put in place. The aim of the Helpdesk is to record any IT related issue across the venues, track them, give them a priority weight, assign them to the relevant supplier(s), to be able to finally give a feedback to the user. It is important that the identity, the contact details, the functional areas and the time and location of the issue is recorded when the issue is logged.

The Helpdesk should have a phone number distributed across the venues. It is advised that some areas like the media centre and the media tribune are manned at all times, with a constant IT support presence, starting from 2 hours before each session.

The issues can then be distributed to the correct supplier (IT supplier, network supplier, Atos/CIS supplier…) and the issue can be tracked according to the Service Level Agreement stated in the contract with the various suppliers.

Network diagram

Appendix 1





Version of the document

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| --- | --- | --- | --- |
| V1.1 | Update | Section 5b | Add requirements for LJ/TJ ruler board:Results VLAN to be distributed to the Long Jump and Triple Jump ruler board |
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