

## Scope of Service for World Cup

Item	Description	Quantity	Remark
1	<i>Hiring of Equipment</i>		
	Cisco Layer 3 24 ports PoE Switch with 4 x GBIC Uplink Modules	2	Placed next to the Timing & Commissaire Podium for Internal network connection
	Cisco Layer 2 48 ports Switch with 4 x GBIC Uplink Modules	2	Place at the Press area and Race Headquarters
	Cisco Layer 2 8 ports Switch with 1 x GBIC Uplink Modules	1	Link with the Internet link from Infield to Control Room
	Cisco IEEE 802.3 a/b/g/n Wifi Standalone AccessPoint with PoE	8	Placed at Press area / Infield / Control Room /Race Headquarters
	Cisco ASA5500 Unlimited Users Security Appliance Firewall	2	Placed at Race Headquarters for general internet access and Team Area for restricted access
	Cisco Router with Failover Redundancy Interface Configuration	2	Placed at Infield for Dual-Internet Lines failover purpose
	APC UPS 750KVA	1	Placed at Press area
	1/4 height 19 inchs Rack Cabinet	1	Placed at Press area
2	<i>Cabling material</i>		
	Cat 5e Cable - 300M per box	4	Cable for infield and Secretariat office
	Cat 5e patch cable - 20M	80	For visitors and internal staff computer network connection
	RJ45 connector	100	AMP RJ45 Connector
	Fiber - 20M	8	IBM / Cisco / AMP
3	<i>Labour works</i>		
	Cabling service		To install Cat Cable, fiber for the backbone and 40 connection point for enduser in Press area
	Installation and configuration of networking equipment		VLAN, QoS, MSSID, WPA2, EtherChannel, InterVLAN, PAT, Application Firewall
	CCNA / CCNP On site support service on 20 to 28 Jan 2018		From 08:00 to 23:00
	Dismantle networking equipment and cabling		Dismantle work will be held on 2 Dec 2019

1. All wired and wireless connected users have internet access with bandwidth priority for different VLAN.
2. Basic firewall functionalities for internet access and banned all incoming traffic for hosting services internally.
3. EtherChannel configuration for all inter-connected switches.
4. Hot Standby configuration for firewall
5. DHCP, SSID and all basic necessary configuration for the event.

From Syslog report last year, at peak hours concurrent connection reached 1,260 nodes or devices (In which over 80% are wireless devices and 20% are wired devices) . All Access Point (Wifi) are fully occupied and Internet connection reached 98% usage. Implication bottleneck appeared in Access Points, we have made proper arrangement with vendor in traffic allocation to made sure "Press" and "Tissot Timing" can be allocated sufficiency bandwidth throughly the race days. Below is our suggestion for vendor in equipment amendment.

1. At least 8 Access Points to cover the in-field area. (In theory, 800-1200 devices can be supported. And we have to aware LIVE broadcast from Press are became commonly used un-doubtly.)
2. Even Access Point distribution across "Home String" area to off-load the the 8 Access Points.
3. Fixed bandwidth for "Press" to make sure without intrusion throughly the race days.
4. Dedicated bandwidth allocate for "Tissot Timing" as critical mission during the whole race.
5. Fiber connection in all inter-connection node to reduce bottleneck situation.