



**Spectrum Newsletter 05/2015**

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## **Rio 2016 Games Time Policy for Private Wi-Fi**

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**Spectrum Management - AF - Telecom**



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# 1 | INTRODUCTION AND GOALS

This document has the following objectives:

- To describe the deployment strategies for access points of Wi-Fi networks that will be available at competition and non-competition venues during Games time.
- To determine private Wi-Fi device spectrum management policy and usage restrictions.
- To protect critical services that may use the Wi-Fi frequency band, such as the Olympic WLAN (Rio 2016 WLAN), timing and scoring, wireless ticket scanning and lighting and sound controls (ceremonies).

## 2 | TERMINOLOGY

Wi-Fi is a means by which portable devices (laptops, tablets, smartphones, etc.) can connect to the internet without the need for cables. In most cases, an access point (AP) is used to create the wireless connection, which will be connected to one of the existing internet ports. Wi-Fi allows the user a certain amount of freedom concerning their location, but also increases the number of users on the same internet line. Therefore, browsing and download/upload speed tends to decrease. Wi-Fi will be in high demand at Games time and will not only be used by Rio 2016 employees, but also by Olympic and Paralympic family members.

Private Wi-Fi is a wireless local area network (WLAN). For the Rio 2016 Games, networks will be installed by the accredited users, previously coordinated and authorised with Rio 2016 Spectrum Management.

SSID (Service Set Identifier) is the specific name given to a Wi-Fi network, used by the mobile devices to be identified and thus allowed to connect to the correct network. Each individual network will be given an SSID, managed by the Telecommunications Functional Area within Rio 2016.

## 3 | POLICY DESCRIPTION

### 3.1 RIO 2016 WI-FI NETWORK

- Network usage planning is carried out by the Rio 2016 Telecommunications Functional Area (Telecom FA). All wireless APs inside the competition and non-competition venues must be approved and coordinated by the respective FA in order to maintain quality and limit potential interference.
- Private Wi-Fi networks will be eventually allowed in some media specific areas in competition venues, inside specific areas in accommodation villages (for example, in NOC & NPC offices, common and hospitality areas in the Olympic Park, and the private media offices).
- The premise is to deploy Wi-Fi services only where a cable solution or the Rio 2016 WLAN is not usable and/or non-practical, and wireless access is critical for operations. In such cases, use of private Wi-Fi services must be minimised, as Rio 2016 will be providing wired internet access and WLAN in most locations. Analysis for approvals must be highly accurate.
- Rio 2016 operational services have priority over possible private networks in the spectrum planning process.
- In venues where there may be existing Wi-Fi networks (legacy), the Rio 2016 Telecom FA will shut down equipment to prevent radio interference.
- The use of private Wi-Fi equipment in the Rio 2016 venues with specific SSIDs for each different network will require coordination with Rio 2016 Spectrum Management, through the use of the frequency management tools, available from the Committee.
- Questions should be emailed to [spectrum@rio2016.com](mailto:spectrum@rio2016.com).

### 3.2 PRIVATE WI-FI SPECTRUM MANAGEMENT

- Rio 2016 will receive private Wi-Fi network applications via the Spectrum Order Portal and/or Excel spreadsheet form for bulky submissions or test events, with the objective of coordinating temporary network usage.

- There are no guarantees of successful applications or quality of service.
- During set up, applicants will be required to programme their AP with the wireless network name (SSID) and radio channel(s) assigned by Rio 2016.
- Uncoordinated or unauthorised Wi-Fi access points will be turned off by Rio 2016. Spectrum Management has the authority to enforce compliance, and if required can request the IOC to consider the withdrawal of accreditation.
- There will not be any Rio 2016 support for the design and operations of the Wi-Fi private networks.
- Rio 2016 Wi-Fi networks will be limited to a maximum of four channels in the 5 GHz band. The use of the 2.4 GHz band channels will be allowed for private Wi-Fi networks in the Rio 2016 venues only in extraordinary circumstances, where it has been proven impossible to use 5 GHz channels.
- Private Wi-Fi services will be coordinated by Rio 2016 Spectrum Management with the support of the ANATEL enforcement agents. Wireless APs will be previously approved for use inside Rio 2016 venues in order to maintain quality and limit potential interference.
- For successful applications, Rio 2016 will define the radio channels and wireless network name (SSID). The SSID structure will be PRIV2016-extension (maximum of eight characters identifying the requesting organisation) and a maximum of four channels in the 5 GHz frequency band.
- For these private networks, channel numbers 64, 132, 136 and 140 are reserved for operation in the shared mode by users located in the same coverage area. Although proposed to be shared among users, channels must be applied one by one for coordination purposes.
- Equipment must be capable of being tuned to the up channels for frequency coordination purposes.
- The use of high directive antennae in the private networks coverage design is strongly recommended, aiming to minimise interference between users sharing the same spectrum resources in the same coverage area.
- To enter Rio 2016 venues, authorised access points must go through test and tagging (T&T) established procedures. In this case, users must schedule a date

and time with the Rio 2016 Service Desk, and submit equipment with spectrum use authorisation to the ANATEL determined Spectrum Desk. For more details, please consult Rio 2016 Procedures PR.TEL.019 and PR.TEL.020. The starting date for scheduling T&T will be provided in a future Spectrum Newsletter.

## 4 | CHANNEL AND FREQUENCY ALLOCATION FOR WI-FI IN BRAZIL

### 4.1 2.4 GHZ BAND

The 2.4 GHz Wi-Fi spectrum in Brazil extends from 2.401 GHz to 2.4835 GHz. Channels in this frequency band are not permitted for use in private Wi-Fi networks at Rio 2016. Only very special cases will be considered for analysis upon request.

### 4.2 5 GHZ BAND

The 5 GHz band in Brazil (5170 - 5835 MHz) contains 24 non-overlapping channels of 20 MHz bandwidth each, structured as follows:

#### a. For indoor use:

Channels-Frequencies (MHz)

CH 36 - 5180

CH 40 - 5200

CH 44 - 5220

CH 48 - 5240

CH 52 - 5260

CH 56 - 5280

CH 60 - 5300

CH-64 - 5320



#### **b. For indoor and outdoor use - with DFS**

Channels and frequencies (MHz)

CH 100 - 5500

CH 104 - 5520

CH 108 - 5540

CH 112 - 5560

CH 116 - 5580

CH 120 - 5600

CH 124 - 5620

CH 128 - 5640

CH 132 - 5660

CH 136 - 5680

CH 140 - 5700

#### **c. For indoor and outdoor use**

Channels and frequencies (MHz)

CH 149 - 5745

CH 153 - 5765

CH 157 - 5785

CH 161 - 5805

CH 165 - 5825

## **5 | REFERENCES**

1. Jim Florwick, Jim Whiteaker, Alan Cuellar Amrod and Jake Woodhams - Wireless LAN Design Guide for High Density Client Environments in Higher Education, CISCO, November 2013
2. Meraki, Network Design Guide, May 2011.
3. CISCO White Paper, Antenna Patterns and their meaning, 2007.

#### 4.2015

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