NAME

ieee80211_regdomain - 802.11 regulatory support

SYNOPSIS

#include <net80211/ieee80211_var.h>
#include <net80211/ieee80211_regdomain.h>

int
ieee80211_init_channels(*struct ieee80211com *, const struct ieee80211_regdomain *,*
  const uint8_t bands[]);

void
ieee80211_sort_channels(*struct ieee80211_channel *, int nchans*);

*struct ieee80211_appie **
ieee80211_alloc_countryie(*struct ieee80211com **);

DESCRIPTION

The **net80211** software layer provides a support framework for drivers that includes comprehensive regulatory support. **net80211** provides mechanisms that enforce *regulatory policy* by privileged user applications.

Drivers define a device's capabilities and can intercept and control regulatory changes requested through **net80211**. The initial regulatory state, including the channel list, must be filled in by the driver before calling **ieee80211_ifattach**(). The channel list should reflect the set of channels the device is *calibrated* for use on. This list may also be requested later through the *ic_getradiocaps* method in the *ieee80211com* structure. The **ieee80211_init_channels**() function is provided as a rudimentary fallback for drivers that do not (or cannot) fill in a proper channel list. Default regulatory state is supplied such as the regulatory SKU, ISO country code, location (e.g. indoor, outdoor), and a set of frequency bands the device is capable of operating on. **net80211** populates the channel table in *ic_channels* with a default set of channels and capabilities. Note this mechanism should be used with care as any mismatch between the channel list created and the device's capabilities can result in runtime errors (e.g. a request to operate on a channel the device does not support). The SKU and country information are used for generating 802.11h protocol elements and related operation such as for 802.11d; mis-setup by a driver is not fatal, only potentially confusing.

Devices that do not have a fixed/default regulatory state can set the regulatory SKU to SKU_DEBUG and country code to CTRY_DEFAULT and leave proper setup to user applications. If default settings are known they can be installed and/or an event can be dispatched to user space using **ieee80211_notify_country**() so that devd(8) will do the appropriate setup work at system boot (or device

insertion).

The channel table is sorted to optimize lookups using the **ieee80211_sort_channels**() routine. This should be done whenever the channel table contents are modified.

The **ieee80211_alloc_countryie**() function allocates an information element as specified by 802.11h. Because this is expensive to generate it is cached in *ic_countryie* and generated only when regulatory state changes. Drivers that call **ieee80211_alloc_countryie**() directly should not help with this caching; doing so may confuse the **net80211** layer.

DRIVER REGULATORY CONTROL

Drivers can control regulatory change requests by overriding the *ic_setregdomain* method that checks change requests. While drivers can reject any request that does not meet its requirements it is recommended that one be lenient in what is accepted and, whenever possible, instead of rejecting a request, alter it to be correct. For example, if the transmit power cap for a channel is too high the driver can either reject the request or (better) reduce the cap to be compliant. Requests that include unacceptable channels should cause the request to be rejected as otherwise a mismatch may be created between application state and the state managed by **net80211**. The exact rules by which to operate are still being codified.

SEE ALSO

regdomain(5), ifconfig(8), ieee80211(9)