a 30,000 feet look at wi-fi, the freezing spot

luiz “effffn” eduardo

DEFCON.
hello

DefCon 17
before we start...
so, why freezing spots?
agenda

- motivation
- the old and the new
- the pieces of the puzzle
- the experiment(s)
- next?
DefCon 17
the pieces of the puzzle
Hooters Air

B-757-200
Passenger Safety Procedures
the old school way
the "new" stuff
so, I asked...
Hello Luiz,

You have asked a great question!

What has changed that internet is now available during flight is technology. With the ability to use Wi-Fi frequencies instead of cellular frequencies this has been approved! The FAA still has all voice communication prohibited.

If you would like more information on this please feel free to visit the links below:
http://www.aa.com/content/amrcorp/pressReleases/2008_08/20_gogo.jhtml
and
http://www.aircell.mediaroom.com/index.php?s=43&item=78 (the article the approves the FAA is dated April 2, 2008)

Looking forward to working with you!

For more information, please check out our website at www.gogoinflight.com. On this site you can sign up for our newsletter informing you of updates and promotions! Our friendly Gogo Customer Care representatives are available by Live Chat from the gogoinflight.com website or call us in person at 1-877-350-0038.

Happy Travels *-)™
Gogo Customer Care
You are one of our very best customers and we appreciate your inquiry about WiFi Internet Connectivity aboard our aircraft. Please know that we carefully tested this product for some time before implementation on our 767-200 aircraft. We would never offer any inflight product or service that would be a safety issue.

We value your long-standing loyalty and support and are eager to continue the relationship we have enjoyed over the years. Please be assured we are all working hard to provide the high quality service you have every right to expect when traveling on American Airlines.

Sincerely,

DefCon 17
in Brazil

- seems to still be pending ANATEL’s approval
- but should be the same as abroad

- but we’ll talk further about that...
so, who's currently providing the service??
AMERICAN AIRLINES CAN BITE ME
~ THE CONTEST ~
Some airlines are making a new attempt to give passengers wireless access to the Internet at 30,000 feet, and 500 mph.

The network operator, Aircell, has switched on the cellular network that links Wi-Fi access points in airborne aircraft with the Internet. In effect, the jet is a Wi-Fi hot spot with a cellular backhaul connection to a ground point of presence. The commercial service, called GoGo, will be available soon on select American Airlines and Virgin Atlantic long-haul domestic flights.

Any 802.11abg device can connect to a Wi-Fi access point aboard the jet. A cellular connection, based on CDMA EVDO technology in the 3MHz band, links the onboard network to one of 92 ground base stations, which connect to a fiber network or point of presence. Aircell says those stations blanket the continental United States (when above 10,000 feet) and deliver an uplink data rate of 3.1Mbps, and a downlink rate of 1.8Mbps. Aircell plans to use compression techniques, which may boost those rates.
767-200

Aircraft & Aircraft Carrier Data | Airlines.net
Total 767-200/200ER orders stood at 239, of which 229 have been delivered. Initially Boeing intended to offer two versions, the longer 767-200 and short...

Aviation Photos: Boeing 767-200
Top Views >. Today - One Year or Older - One Month or Older - One Week or Older - 48 Hours or Older - Recently Uploaded Shots...

www.airliners.net/search/photo/search?aircraft_generic=Boeing%20767-200&distinct_entry=true - 155k - Cached - Similar pages - Note this
More results from www.airliners.net »
Restrictions. You agree not to resell or attempt to resell any aspect of the Service, whether for profit or otherwise, share your Internet Protocol address ("IP address") or Service connection with anyone, access the Service simultaneously through multiple devices or authorize any other individual or entity to use the Service. You agree that sharing the Service with another party breaches the Agreement and may constitute fraud or theft, for which we reserve all rights and remedies. You have no proprietary or ownership rights to a specific IP address or other address, log-in name, or password that you use in connection with the Service. We will assign you an IP address each time you access the Service, and it may vary. You shall not program any other IP address into your device. The Service is only available on certain equipped airplanes, and unless otherwise stated by Aircell in writing, is not available outside the continental United States. You may use the Service only when the use of electronic devices is permitted by the applicable airline.

No Voice Applications. You will not use any type of voice application (including, without limitation, voice over Internet protocol) without written permission from Aircell.

Hardware Requirements. A compatible laptop, personal digital assistant or handheld device with WI-FI capability is required to enable operation of the Service. You are responsible for any fees or charges associated with the device and the use of the device. You must ensure your device is compatible with the Service. It is your responsibility to make sure the device being used to connect to the Service has a WI-FI radio connection.

Additional Service. Services in addition to the basic Service may be subject to additional terms. Aircell will inform you of any such additional terms when you sign up for such services. Except as otherwise provided by such additional terms, any additional services will be considered part of the Service.
FlyNet® - Lufthansa continues to back Internet on board
Boeing: Service secured up to 31st December - future uncertain

Lufthansa deeply regrets Boeing's intention to discontinue the Internet broadband service Connexion by Boeing (CBB). This will not have any immediate consequences on Lufthansa FlyNet users. Boeing has given assurances that it will continue the service until the end of the year. Lufthansa FlyNet is enjoying increasing popularity and has proved to be technically very reliable. The level of customer interest is indicated by figures of up to 40 users per flight on North Atlantic and Asian routes. Most recently, around 30,000 Internet users were active on board Lufthansa flights each month. Surveys have shown that 94 percent of the CBB customers plan to use the service again; 92 percent want to recommend it to others.

Up to now, Connexion by Boeing has been the only supplier for broadband Internet use aboard aircraft. Due to the new situation, the market is currently restructuring itself. In the interest of its passengers, Lufthansa hopes to be able to continue to offer FlyNet in future and, therefore, is conducting intensive discussions with Boeing as well as several other potential providers. Meanwhile, as matters stand it cannot be ruled out that there will be a temporary interruption of the service as of January 2007.

For a long time, Lufthansa was not only the first, but also the only CBB partner worldwide. With 62 long-range aircraft equipped with the system, the airline today has the largest Internet-capable fleet. Lufthansa FlyNet started regular operations on 17th May 2004 on board flight LH 452 from Munich to Los Angeles. Between 15th January and 18th April 2003, a precursor system had passed its test with flying colours on the Frankfurt - Washington route.
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Download virus and spyware protection with the free Google Pack.

Speed Test Result

dslreports.com speed test 2006-12-25 05:31:10 EST:
178 / 30 (kbps)
(21.7 / 3.7 KB/sec)

MegaPath T1
For Only $359

Slow Internet =
Low Productivity
888-663-4642-Tall
to a Real Person

Add Your Result to our 'Fastest Broadband' table
[+] click if you can help us by identifying your ISP, product, and advertised speed

ZIP code:
So...

- it worked
- good rf coverage
- slow/ latency
- session persistency apps
- expensive (?)
We're sorry, the page you are attempting to access is currently unavailable.

This may be due to issues with the website you are trying to visit, or the airplane is outside the coverage area. Coverage is available within the continental U.S. while the airplane is above 10,000 feet. Please try again in a minute. We apologize for the inconvenience.
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Spectrum Mgmt Disabled
Channel Agility Not Used
FSCC Not Allowed
Short Preamble
Privacy Enabled
CF Roll Not Requested
CF Not Pollable
Not an IBSS Type Network
1 ESS Type Network

SSID
Element ID: 0
Length: 1
SSID:

Supported Rates
Element ID: 1
Length: 8
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Supported Rate: 2.0 Mbps (BSS Basic Rate)
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Supported Rate: 6.0 Mbps (Not BSS Basic Rate)
Supported Rate: 9.0 Mbps (Not BSS Basic Rate)
Supported Rate: 11.0 Mbps (BSS Basic Rate)
Supported Rate: 12.0 Mbps (Not BSS Basic Rate)

Direct Sequence Parameter Set
Element ID: 3
Length: 1
Channel:

Traffic Indication Map
Element ID: 5
Length: 4
DTIM Count: 0
DTIM Period: 2
Bitmap Control: 

--- ---. Bitmap Offset: 0
Proxy Server Detected!
(proxy test results)

Proxy Server IP address: 12.130.106.111
Proxy Server Details: 1.1 172.30.4.2.3128 (squid/2.6.STABLE14)

Proxy Reports IP as: 172.30.1.164
(Unable to confirm.)

GoToMyPC - Access Your PC from Anywhere

Starting Nmap 4.53 (http://insecure.org) at 2008-09-14 16:16 Pacific
Daylight Time
Interesting ports on 172.30.1.2:
Not shown: 1712 filtered ports
PORT     STATE SERVICE
38/tcp   open http
3128/tcp open squid-http
MAC Address: 00:EB:4B:1A:DB:73 (Jump Industrielle Computertechnik GmbH)
Nmap done: 1 IP address (1 host up) scanned in 11.734 seconds

Is my IP address blacklisted?
Can someone find out who I am by my IP?
I've been banned, what do I do?

12.130.106.111 [Lookup IP Address]
IP Lookup now shows ISP, Organization, Proxy Status, and Connection Type!

What is an IP address?

Every device connected to the public Internet is assigned a unique number known as an Internet Protocol (IP) address. IP addresses consist of four numbers called a 'dotted-quad' and look something like 127.0.0.1.

Since these numbers are usually assigned to internet service providers within region-based blocks, an IP address can often be used to identify the region a computer is connecting to the Internet. An IP address can sometimes be used to show the user's general location.
come back later

We're sorry, the page you are attempting to access is currently unavailable.

This may be due to issues with the website you are trying to visit, or the airplane is outside the coverage area. Coverage is available within the continental U.S. while the airplane is above 10,000 feet. Please try again in a minute. We apologize for the inconvenience.

Pinging www.google.com [1.1.1.1] with 32 bytes of data:
Request timed out.
Scanning 179 hosts [1 port/host1]
Completed ARP Ping Scan at 23:29, 3.50s elapsed <179 times>
Initiating Parallel DNS resolution of 179 hosts. at 23:29
Completed Parallel DNS resolution of 179 hosts. at 23:29
Initiating Parallel DNS resolution of 1 host at 23:29
Completed Parallel DNS resolution of 1 host at 23:29.
Initiating SYN Stealth Scan at 23:29
Scanning 172.30.1.2 [1714 ports]
Discovered open port 80/tcp on 172.30.1.2
Completed SYN Stealth Scan at 23:29, 8.72s elapsed <1714 ports>
Host 172.30.1.2 appears to be up ... good.
Interesting ports on 172.30.1.2:
Not shown: 1713 filtered ports
PORT STATE SERVICE
80/tcp open http
MAC Address: 00:0e:4b:1a:d8:86 <Jump Industrielle Computers>

Initiating ARP Ping Scan at 23:29
Scanning 76 hosts [1 port/host1]
Completed ARP Ping Scan at 23:29, 2.22s elapsed <76 times>
Initiating Parallel DNS resolution of 76 hosts. at 23:29
Completed Parallel DNS resolution of 76 hosts. at 23:29
Skipping SYN Stealth Scan against 172.30.1.179 because Host 172.30.1.179 appears to be up ... good.
0 ports scanned on 172.30.1.179

Initiating SYN Stealth Scan at 23:29
Scanning 172.30.1.180 [1714 ports]
Completed SYN Stealth Scan at 23:30, 38.66s elapsed <1714 ports>
Host 172.30.1.180 appears to be up ... good.
All 1714 scanned ports on 172.30.1.180 are filtered
MAC Address: 00:41:70:12:62:27 <Apple>

Read data files from: C:\Program Files\Nmap
Nmap done: 256 IP addresses (3 hosts up) scanned in 54.64s
Raw packets sent: 7365 (232.042KB) | Recvd: 0

C:\> arp -a

Interface: 172.30.1.179    --  0x20003
Internet Address   Physical Address   Type
172.30.1.2    00-e0-4b-1a-d8-86   dynamic

C:\> ping 172.30.1.180

Ping 172.30.1.180 with 32 bytes of data:

Control-C

C:\> arp -a

Interface: 172.30.1.179    --  0x20003
Internet Address   Physical Address   Type
172.30.1.2    00-e0-4b-1a-d8-86   dynamic
172.30.1.180    00-1e-52-c1-c2-27   dynamic
Search ARIN WHOIS for: aircell

Submit Query

AIRCELL (AIRCE-1)
AIRCELL AIRCELL851-10-48 (NET-12-192-10-48-1) 12.192.10.48 - 12.192.10.55
Aircell Communications SBCIS-100320-15433 (NET-63-203-25-0-1) 63.203.25.0 - 63.203.25.7
Aircell LLC SUNGARD-04970AE1-8AAE-4298-8DB (NET-74-205-236-96-1) 74.205.236.96 - 74.205.236.103

# ARIN WHOIS database, last updated 2008-09-13 19:10
# Enter ? for additional hints on searching ARIN's WHOIS database.
so I guess I have a mic

try this... if you don't mind

from your cell

says:

yes, I think so, do I hear a woman?

ok

Luiz Eduardo says:

call 408

calling

says:

hahaha

do you hear anything?

says:

nope

Luiz Eduardo says:

says connected through

yeah... rang once
okay, but, how about security?
lessons learned
how about the service in other countries?
major differences
some details
(and I can always be wrong, remember?)

- user cellphone connects to mini cell network in the plane
- voice and data calls get routed to satellite* that connects to ground stations
- crew controlled voice calls
  - being able to switch to silent mode
    (thank God!)
- # of simultaneous calls
- uplink speed, depends on the technology
thanks

luiz.eduardo(a t)gmail.com