FIT ASIA
Central Reporting Agency –Problem Report Briefing

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Agenda

- Introduction
- PR definition
- Asia region PRs
- Notable PRs outside of Asia region
- Issues seen hindering PR investigations

Introduction

- ATS stakeholders can file PRs for investigation on the following site: http://www.fans-cra.com/

- Website hosted by Airways Corporation of New Zealand Limited
- Now used for:
  - CRA for South Pacific (ISPACG FIT)
  - CRA for North, Central, East Pacific (IPACG FIT)
  - DLMA for North Atlantic (NAT TIG)
  - FIT-ASIA for South China Sea, Bay of Bengal, Indian Ocean
- Continue to get new entities registered with website
  - To register, select “sign up” on the top right of the website.
- De-identified reports starting from 2016 are also available for viewing
- This website also hosts the PBCS charter

PR Status Definitions

- **RAISED** - the PR has been filed by the originator but has not yet been processed by the CRA
- **ACTIVE** - CRA has processed the PR and allocated a PR # and someone to investigate it. During this phase the PR is under investigation
- **OPEN** - The CRA investigation is complete however some form of correction is required before it can be closed
- **OPEN- FIX AVAILABLE-** Corrective action has been implemented and fix is available for installation.
- **CLOSED AS DUPLICATE** - Closed because problem is already covered/tracked under another PR
- **CLOSED** – Corrective action has been implemented

PR Type Definitions

- **TBA-** To be assigned
- **AIR-** Avionics or flight crew issue
- **AIR- Procedural:** Flight crew issue
- **AIR- Technical:** Avionics issue
- **GROUND:** ATS unit system or controller issue
- **GROUND- Procedural:** ANSP Controller issue
- **GROUND- Technical:** ATS unit system issue
- **NETWORK:** CSP or SATCOM service provider issue
- **MULTIPLE:** Multiple types of issues
- **NONE:** Report is non-problem

PRs filed by Asia Region

- Between July 2019 and July 2020 66 PRs have been filed for the Asia region.
- This is a noticeable increase compared to the 45 PRs filed during the one year period leading up to FIT ASIA/9.

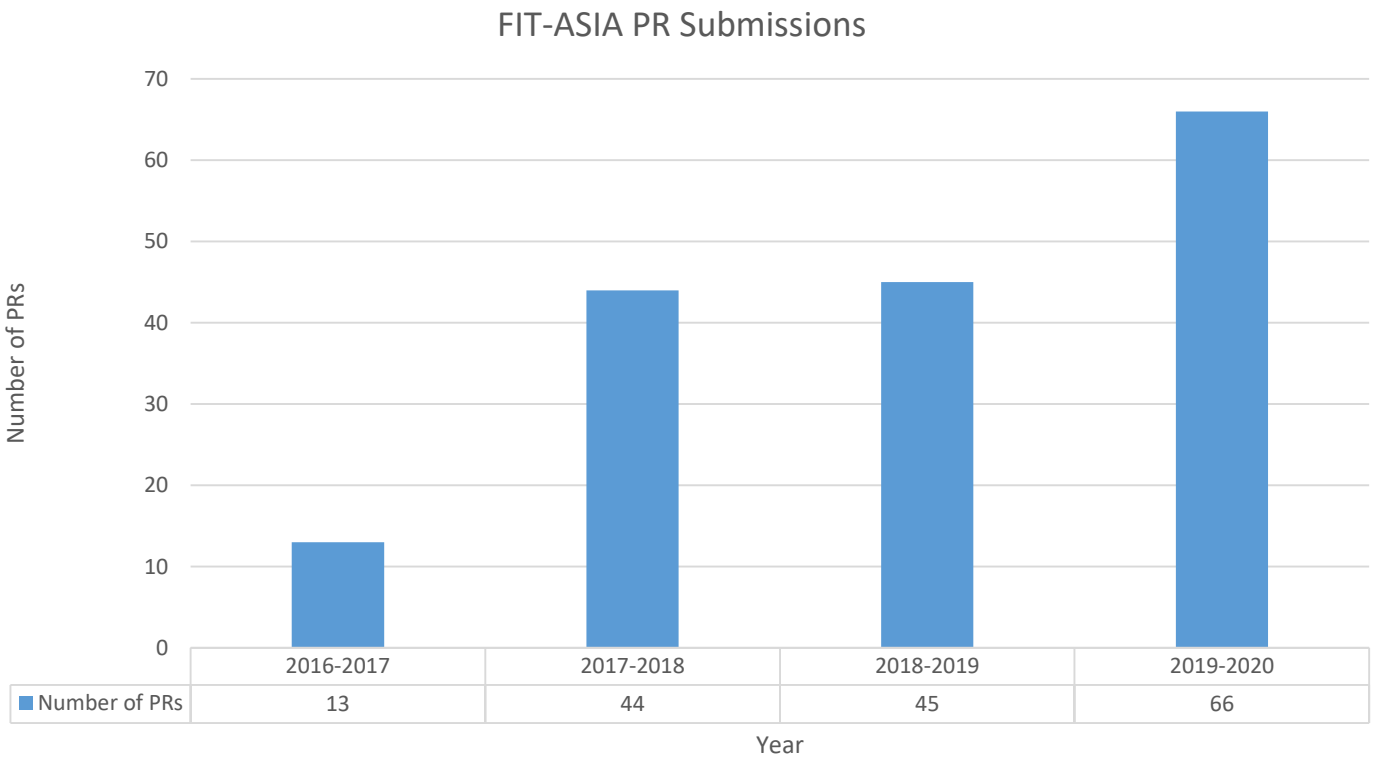

Chart 6

Significant Asia Region PRs

2953-RP CPDLC Connection Attempt Failed

Status: CLOSED/AIR-TECHNICAL

An ATS Center reported delays in message delivery, as well as a failed CPDLC connection attempt with an aircraft. Analysis indicated that there were two issues contributing to this problem.

The first was a temporary loss of SATCOM link while also out of VHF coverage. This led to message delivery delays until the link was re-established. This behavior is common for the area in which the aircraft was flying.

The CPDLC connection failure was due to an instance of “ack-n-toss” where messages were confirmed received by the aircraft, but not delivered to the end system for processing. A fix for the ack-n-toss issue has been incorporated into CSB/CLR9 and CSB/CLR7.5 and is available for installation through Airbus on A320/A330/A340 (Issue is not applicable to A350 or A380) models.

2957-MM Logon Failure

Status: CLOSED/GROUND-TECHNICAL

An operator reported experiencing difficulties with an automatic transfer. The ACARS message logs indicated that CTR1 did correctly uplink an NDA to the aircraft to begin the transfer process. However, CTR1 did not perform AFN address forwarding using the CTR2 address which caused the transfer process to fail.

In discussing this with CTR1 they indicated this may have been due to a configuration issue with their ground system which was updated in Nov 2019. There have been no further reports of the issue.

2977-SH ADS-C Performance Issue

Status: OPEN/AIR-Technical

A specific aircraft tail was identified as having consistently poor ADS-C performance. Initial analysis by the CRA showed the media switching between VHF and SATCOM was causing messages to be delayed and queued onboard, leading to further delays.

Additional discussions with the operator indicated that the aircraft was operating with a different SATCOM configuration which may have been contributing to the media transitions. The operator was advised to contact the SATCOM supplier to discuss potential improvements.

2982-KS Invalid Data Error Downlink

Status: CLOSED/GROUND-Procedural

An ATS center reported receiving an error downlink indicating “invalid data”.

Analysis of the data showed that the ground had uplinked a message which included UM175. The aircraft, an A350, does not support UM175 “REPORT REACHING [alt]” message per guidance in ICAO DOC 10037 (GOLD - §A.6.1).

The ATC Center was advised of this for their awareness.

Airbus strongly suggests disabling the sending of UM175, in line with ICAO recommended practices.

2984-KS Unexpected Reference Number Downlink

Status: CLOSED/GROUND-Technical

An ATS center reported receiving an error downlink indicating “Unexpected Reference Number”.

Analysis showed that the ground uplinked a message with a MIN (Message Identification Number) of 1 but subsequently experienced some sort of ground system reset which resulted in the existing open message dialogue being closed out. When the flight crew responded to the previous message, the system did not recognize the MRN since the dialogue had already closed.

The cause of the system reset is unknown, however there have been no further reports of this issue, and therefore the PR has been closed.

2985-RP Message Delivery Timeout

Status: CLOSED/AIR

An ATS center reported experiencing message delays for uplinks transmitted to an aircraft.

Analysis showed this was due to the aircraft being in an area of poor VHF coverage and attempting to retransmit the message via VHF before switching to SATCOM.

Considering the route the aircraft was flying, this switching behavior is not unusual. However the CRA suggests that operators who fly routes which may be on the edge of VHF/SATCOM coverage investigate if avionics changes can be made to reduce this transition behavior. Some avionics (not all) have the ability to refine region definition tables, or implement new timers which can improve performance. Operators interested in potential improvements should contact their OEM.

2992-MM Message Delivery Timeout

Status: CLOSED/AIR-TECHNICAL

An ADS-C uplink failed to be delivered to the aircraft due to flying in an area with weak or no VHF coverage. The aircraft did not have SATCOM connection at the time of the uplink and it is unclear what caused the lack of connection. The PR was closed as being due to a technical issue on the aircraft.

However, it is of note that the data showed the SATCOM link being established only seconds after the uplink failed. Which means had the ATS center resent the uplink after a short delay, then it most likely would have succeeded. Additionally ICAO DOC 4444 (Section 14.3.8) recommends that ATS facilities resend failed uplinks one time after a short delay.

3035-MM CPDLC Connection Issue

Status: ACTIVE/TBA

An operator reported inability to perform a manual logon to an ATS center although connection with subsequent centers were successful. The data analyzed showed that the flight crew attempted to logon five times over approximately 30minutes. Each logon attempt received a positive acknowledgement (AFN_Ack) uplink, however there were no CPDLC connection requests (CR1) uplinked to the aircraft.

The PR was assigned to the ATS center for further investigation.

3068-CJ Unable to Logon to CPDLC

Status: CLOSED AS DUPLICATE/AIR-TECHNICAL

An operator reported being unable to logon to CPDLC during their flight. Analysis indicated this was an instance of a known issue with the current B747 Flight Management software. Due to this issue, the CPDLC logon page may freeze and prevent any manual logon attempts from being transmitted.

This issue is being fixed in the upcoming software update “BP4.1” which is expected 1Q 2021. This PR was closed as a duplicate of the master PR 2892-KS.

3074-MM ADS-C Downlink Latency Failed 95% over SATCOM

Status: OPEN/MULTIPLE

An ATS center reported poor RSP over SATCOM. Analysis showed that the problems are likely due to non-contiguous VHF coverage in the South China Sea. In this area, there are delays seen as the avionics attempt to repeat delivery of messages over VHF before reverting to SATCOM.

The CRA advises operators who are experiencing poor performance due to excessive network transitions to investigate the potential for Avionics tailoring which could help reduce the occurrence of such transitions.

The CRA is continuing the investigation for potential additional causes which may be contributing to the poor performance.

3078-MM Flight unable to logon for CPDLC

Status: OPEN/GROUND-Procedural

An aircraft was unable to establish a CPDLC connection with an ATS center. The analysis showed that the automatic transfer of the aircraft was not performed correctly from CTR1 to CTR2. Although CTR1 correctly designated CTR2 as the NDA, there was no attempt to perform AFN address forwarding to complete the transfer process.

Additionally, the flight crew attempted to logon to CTR2 manually, but did not first terminate its existing connection with CTR1. Therefore the manual logon also did not work.

This PR was transferred to CTR1 for further investigation and the operator was reminded that in situations like this, the flight crew should first terminate the existing CPDLC connection prior to logging on.

Notable PRs Reported Outside Asia

2559-MM B738 not meeting 95% RSP

Status: CLOSED/AIR-Technical

An ATS center observed that an aircraft operator's 737 fleet performed below the 95% RSP level during the July to December 2017 period. Analysis by the CRA indicated that the poor performance was primarily due to CMU "next-on-busy" behavior, by which the CMU routes an ACARS downlink (including an ADS-C report) to less-preferred HF datalink if more-preferred SATCOM is already busy sending another ACARS downlink instead of waiting for SATCOM to become available.

The aircraft operator recently disabled CMU "next-on-busy" behavior and the reporting center confirmed that ASP improved to above the 95% level

3004-KS Unable To Respond to Message

Status: CLOSED AS DUPLICATE/AIR-TECHNICAL

An operator reported that they were unable to send a ROGER response to New York because the avionics displayed a BUSY SENDING PREV MSG indication.

The OEM (Gulfstream) indicated that this is a known issue that will be resolved by the G650 Block 3 update scheduled for release in late 2020.

The CRA is tracking this issue with master PR 2976-MM.

2662-SH PBCS Monitoring- Under Performing B777

Status: ACTIVE/AIR-Technical

An ATS center reported that seventeen B777 airplanes operated by different aircraft operators did not meet the 95% RSP requirement during September 2019. Boeing found the following common causes for the poor performance.

i) Downlinks were queued while waiting for a duplicate to be sent, as observed first in PR 2933-KS. These duplicate reports delay other reports from being sent on time. For two aircraft, once the duplicates were removed from the data, the aircraft performance was above 95%.

ii) VHF to SATCOM transitions. Operators could consider tightening up their VHF region tables. This change would reduce the airspace where the avionics attempt VHF downlinks. Additionally, Boeing is considering implementing the RAT1 timer in a future 777 avionics block point update.

iii) Slow SATCOM connectivity. Downlinks were delayed over SATCOM for undetermined reasons. Boeing and SATCOM avionics suppliers are investigating the cause for these events.

Less significant Asia region PRs

- There were 48 less significant Asia region PRs
- Please refer to the associated working paper for more details regarding these PRs

Issues Hindering PR Investigations

Not Enough Data Points to Conduct Analysis

Several reports of various airframes which did not meet required RCP/RSP. However no detailed analysis was able to be performed due to lack of data. In some instances there were not enough data points to make a statistically viable assessment of the issue. And in others, the required supporting data, such as performance broken down by aircraft registration or the datalink logs were not available.

The CRA stresses that generally, at least 100 data points are required to make an assessment of what may be occurring. If an aircraft does not have greater than 100 data points in a certain airspace, it is suggested to combine data with a neighboring airspace to see if the data set can be completed. Or for the ATS center to monitor those particular aircraft to see if their poor performance constantly continues and warrants an investigation, even without the 100 data points.

2896-SH, 2917-SH, 2918-MM, 3031-MM, CLOSED/TBA.

Incorrect or Missing Data in Filed PR

Several PRs have been filed where the initial submission was missing details in the report which prevented further investigation. Follow up with the originator did not finalize the details in time to perform additional analysis.

The CRA would like to stress that double checking all inputs prior to submitting the PR is crucial. Since datalink logs are only available for a limited amount of time, many times it is too late to obtain the correct data by the time the original issue details are confirmed.

The critical items are: date, aircraft tail and problem description. The time of the event is also extremely helpful.

2983-KS, CLOSED/NON Problem.

Inability to Obtain Logs

There were several PRs which were delayed in being investigated because of inability to get datalink logs. The aircraft operator is always cc'd on any request, however datalink service providers often require direct approval from the aircraft operator prior to releasing logs to the OEM. Since logs are only available for a limited time, delays can result in the data no longer being available.

SPs have agreed to release logs as per the PBCS charter (section 6.4.1) for those operators who have signed the charter, as long as they are cc'd on the original request. The CRA would like to advocate for operators to sign the PBCS charter and expedite approval of any log requests, if required. We still have entities who have not signed the charter but have issues noted with their aircraft.

2994-CJ, CLOSED/TBA.

CRA Website Information

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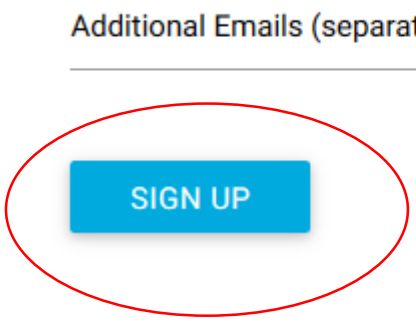
All ATS datalink stakeholders should sign up for the FANS CRA website.

1) Access www.fans-cra.com
2) Select Sign Up on the upper right

FANS1/A Problem Reporting

3) Fill out form and select Sign Up on the bottom left



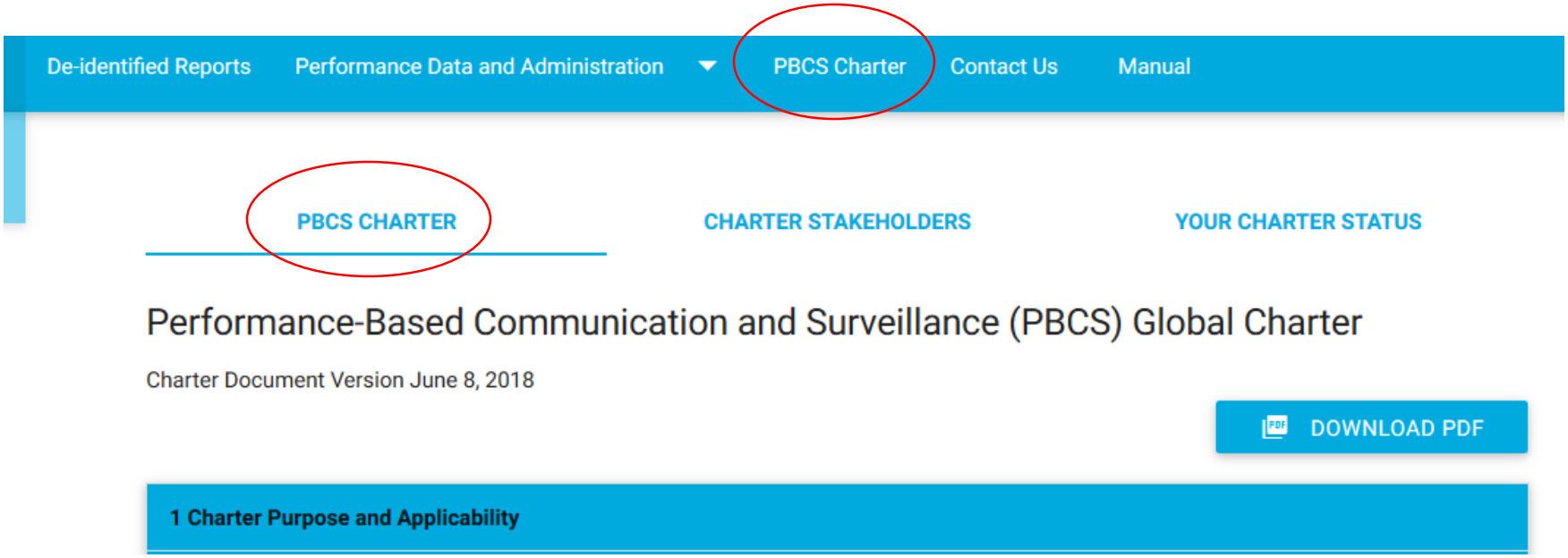
PBCS Charter sign up

All PBCS stakeholders are encouraged to sign the charter.

1) Access www.fans-cra.com and sign in

2) Select PBCS Charter from the top banner

3) Under “PBCS Charter” tab, read each section of the charter (a pdf can be downloaded via the “download pdf” button on the top right of the tab)

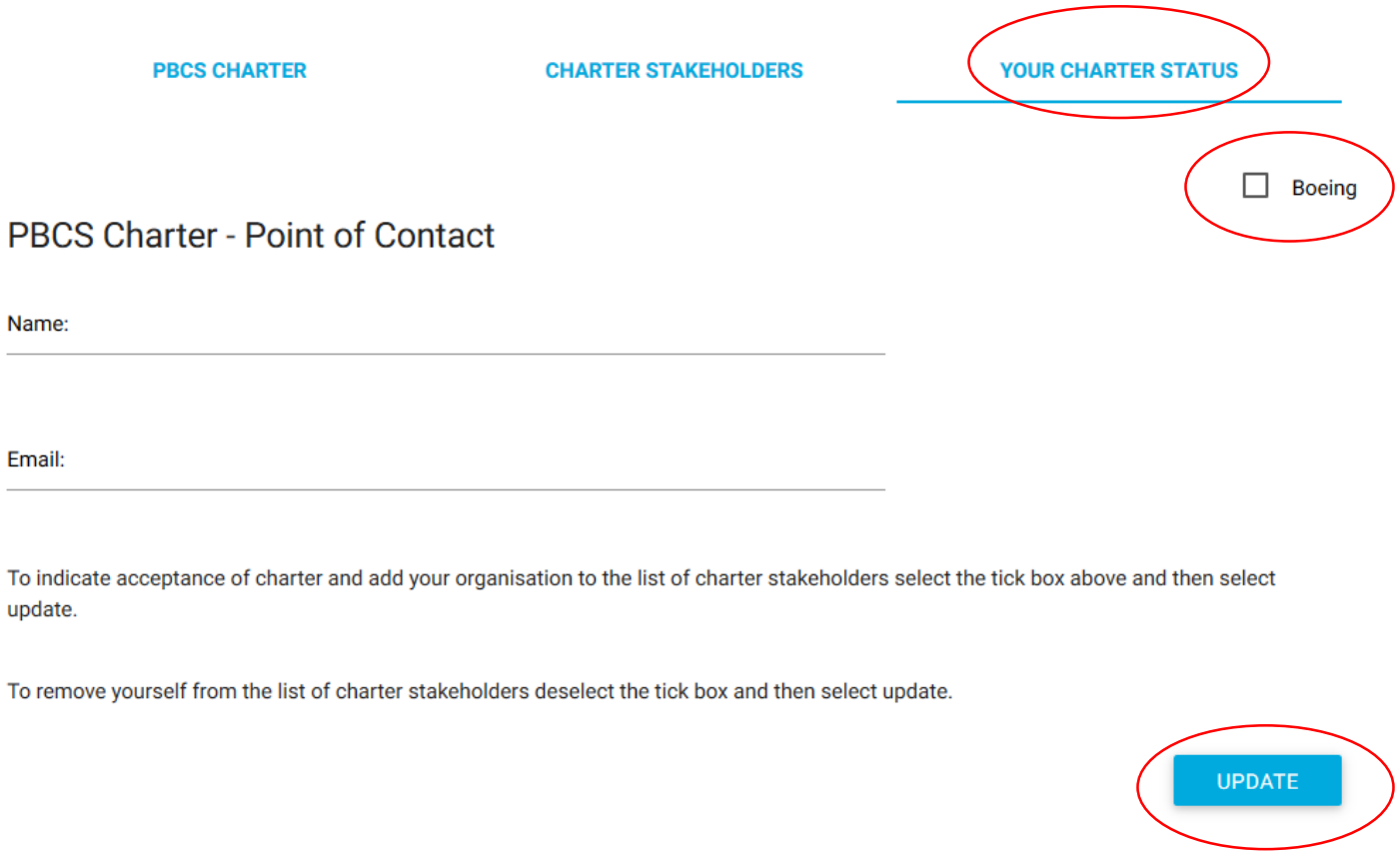


PBCS Charter sign up

All PBCS stakeholders are encouraged to sign the charter.

4) Select “your charter status” tab

5) Fill out form, and select the checkbox on the top right. Then select “update” on the bottom right.



Interoperability Testing

- Offered through the Boeing Company (outside of CRA responsibilities).
- Testing has been done with multiple ANSPs within and outside of Asia.
- Interoperability testing with ANSPs allow for live testing of the system using actual networks (SITA/ARINC) and real Avionics (Boeing test facilities)
- Allows for detection of issues prior to going live
- Can provide a generic interoperability test or do a test more tailored to each ANSP
- Contact: rochelle.e.perera@boeing.com for questions about interoperability testing or to schedule a session

Questions?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