

MINUTES OF THE TWENTY-THIRD SC-223 PLENARY
MEETING
“Internet Protocol Suite (IPS) and AeroMACS”

DATE: August 21 - 25, 2017

TIME: 9:00 a.m. – 5:00 p.m

PLACE: RTCA, Inc.
1150 18th Street NW Ste 910 Washington, DC 20036

CONTACT: Rebecca Morrison, Program Director
(202) 330-0654 or rmorrison@rtca.org

Attendees:

Name	Role	Affiliation	Note
Aloke Roy	Chairman	Honeywell International, Inc.	
Brent Phillips	DFO	Federal Aviation Administration	
Rebecca Morrison	Program Director	RTCA, Inc.	
Dongsong Zeng	Secretary	The MITRE Corporation	
Rafael Apaza	Member	NASA	
Karan Hofmann	Guest	RTCA, Inc.	
Danny Bharj	Member	INMARSAT	
Kristen Mineck	Member	INMARSAT	
Jerry Hancock	Guest	INMARSAT	
Paul Mettus	Member	LS Technology LLC	
Madhu Niraula	Member	Rockwell Collins, Inc.	
Bruce Eckstein	Member	Firebird SE LLC	
Antonio Correas	Member	Skymanatics	
David Robinson	Member	Federal Aviation Administration	
Stephen Van Trees	Member	Federal Aviation Administration	
Pete Skaves	Member	Federal Aviation Administration	
Chris Wargo	Member	Mosaic ATM, Inc.	Via WebEx
Richard Hawkins	Member	WiMAX Forum	Via WebEx
Bill Holzman	Member	Mosaic ATM, Inc.	Via WebEx

In accordance with the Federal Advisory Committee Act, Brent Phillips, Federal Aviation Administration (FAA), was the Designated Federal Official for this meeting.

AGENDA

1. Welcome, Introductions, Administrative Remarks
2. Review of previous meeting notes and action items
3. Review of Current State of Industry Standards
 - a. ICAO WG-I
 - b. AEEC IPS Sub Committee
4. Current State of Industry Activities
 - a. SESAR Programs
 - b. ESA IRIS Precursor
 - c. Any Other Activities
5. IPS Technical Discussions
 - a. Review of IPS draft profile
 - b. Review of DNS, Multilink and Mobility use cases
 - c. Review of IPS RFC detail Profiles, ready to review RFC768, 2464, 1151, 7542, 5795, 4861, 2597, 3260, 2474, 3246, and other use cases
 - d. Prioritization of additional IETF RFCs for Profiling
6. Any Other Topics of Interest
 - a. SC-228 ISRA Discussions
 - b. Other Topics - Jerry presentation on Innova, Antonio to present SESAR slides
7. Plans for Next Meetings
8. Review of Action Items and Meeting Summary
9. Adjourn

Agenda Items 1. Welcome, Introductions, Administrative Remarks

Aloke Roy, Honeywell, welcomed the participants and reviewed the agenda.

In accordance with RTCA policy, Brent Phillips, the designated FAA representative, opened the meeting by reading the following text: “In accordance with the Federal Advisory Committee Act, this Advisory Committee meeting is OPEN TO THE PUBLIC. Notice of the meeting was published in the Federal Register on: March 15, 2016. Attendance is open to the interested public. With the approval of the Chairman, members of public may present oral or written statements at the meeting. Persons wishing to present or obtain information should coordinate with RTCA Program Director – Rebecca Morrison and the Chair – Aloke Roy”

Rebecca Morrison presented the RTCA Proprietary References Policy and Membership Policy.

Agenda Item 2. Review of previous meeting notes and action items

The working group reviewed and approved the of SC-223 P22 meeting minutes, and updated the status of previous action items.

Agenda Item 3. Review of Current State of Industry Standards

3a. ICAO WG-I

Danny Bharj, ICAO WG-I Mobility subgroup chair, reported that the IPS mobility protocol selection was planned to be finalized by the end of 2017, now this date is likely to slip into early 2018. The next Mobility sub-group meeting (September 25-27, 2017) and ICAO WG-I/24 (September 27-29, 2017), will be held at ICAO headquarter, in Montreal, Canada.

3b. AEEC IPS Sub Committee

The AEEC IPS Sub Committee plans to develop AEEC IPS standards in two steps:

Step 1: 18-month planning activity with five 2-day meetings, potentially involving ICAO, RTCA, EUROCAE, etc. (2015 to 2017); and

Step 2: Standards writing (2017 to 2019).

The ARINC Project Paper 658: Internet Protocol Suite (IPS) for Aeronautical Safety Services – Roadmap Document has been circulated in the AEEC IPS subcommittee for review and comments. It is planned that the final ARINC 658 will be submitted to AEEC general session for approval in October 2017.

Agenda Item 4. Current State of Industry Activities

4a. SESAR Programs

The group talked about IPS related work in SESAR2020 multi-annual work program, such as LDACS (PJ.14-02-01), future SATCOM (PJ.14-02-02), IPS including multilink & VoIP (PJ.14-02-04), and AeroMACS (PJ.14-02-06).

4b. ESA IRIS Precursor

Inmarsat SwiftBroadband (SBB) uses native IPv4, subnetwork VPN is possible.

4c. Any Other Activities

The Clean Sky 2 project, funded by European Commission, has a task to prototype IPS airborne router including both hardware and software. Results and requirements from Clean Sky 2 project are expected to come out in the future.

Agenda Item 5. IPS Technical Discussions

5a. Review of IPS draft profile

The group reviewed and agreed on the draft outline of the IPS profile initiated by Alope Roy from Honeywell.

Richard Hawkins, WiMAX Forum, was appointed as the editor of the IPS profile. He provided an initial acronym list for inclusion into the IPS profile.

Dongsong Zeng, MITRE, presented a draft outline slides for IPS profile section 2.2.4 Concept of Operations. The group agreed on the outline with a few modifications.

Action Item P23-6: Dongsong Zeng to flesh out the IPS CONOPS text.

5b. Review of DNS, Multilink, Mobility use cases

DNS

Rafael Apaza, NASA, presented “Domain Name System (DNS) for Aviation Networks” slides, which show DNS components, DNS resolution process, name resolution operation and a list of DNS related RFCs that may be needed for IPS.

Decision 3: Name lookup is a mandatory requirement.

Madhu pointed out that the DNS is one way of name lookup and there may exist other ways of name lookup.

Multilink

Antonio Correas, Skymanatics, presented the “Multilink Use Case” whitepaper to the group.

Decision 5: Multilink function is required.

Decision 6: Subnet access devices on aircraft are treated as layer 2 devices.

Action Item P23-1: Alope Roy to explore subnetwork point of attachment (SNPA) addresses for aircraft.

Action Item P23-2: Madhu Niraula to explore how many subnets typical DSPs have.

Action Item P23-3: Brent Phillips to explore how many subnets FAA enterprise has.

Action Item P23-4: Danny Bharj to explore how many subnets PAN European enterprise has.

Action Item P23-5: Antonio Correas, Madhu Niraula, Dongsong Zeng to review what is available in the IETF for multilink.

Action Item P23-9: Antonio Correas to identify what criteria are needed for link selection.

Mobility

Madhu Niraula, Rockwell Collins, presented “Mobility Scenario” slides and pointed out that the Mobile IP method is more mature than the other two candidate IPS mobility methods, i.e., AERO and LISP. The work group suggested that Madhu bring this Mobile IP method to the WG-I Mobility subgroup for consideration of IPS mobility selection.

5c. Review of IPS RFC detail Profiles

The group reviewed draft profiles for RFC768, 2464 and 5795.

Decision 4: Approved to baseline RFC 768, RFC 2464 profiles and dropped RFC1151 RDP.

Action Item P23-7: Alope Roy to investigate the CRCs of ROHC at system level.

Action Item P23-8: All member to review the existing RFC detail profiles for 5795, 4861, 2597, 3260, 2474, 3246 and provide comments before next telecon.

5d. Prioritization of additional IETF RFCs for Profiling

RFC 4996 and 5225 are planned to be profiled next and added to the to-do list.

Agenda Item 6. Any Other Topics of Interest

6a. SC-228 ISRA Discussions

The group discussed the draft Inter-Special Committee Requirements Agreement (ISRA) from SC-228 to SC-223, which requests SC-223 to collaborate with SC-228 on developing the MASPS for UAS Command and Control (C2) Data Link, and agreed on that the UAS C2 data link performance requirements are independent from IPS functional requirements.

6b. Other Topics

Jerry Hancock, Inmarsat, presented slides entitled “ICAO INNOVA Harmonized Aviation Cybersecurity Global Trust Framework Concepts”. INNOVA is an ICAO task force to harmonize IPS security, addressing, naming service, and trust framework.

Decision 1: Globally unique IPv6 address for aircraft is mandatory.

Decision 2: Ground system global address is optional at ICAO discretion.

Antonio Correias, Skymanatics, presented “IP Airborne Router Deployment Considerations” slides, which summarizes the outcome of AIRTEL-ATN work performed for SESAR 2020PJ14-04-04 task.

Action Item P23-10: Madhu Niraula to generate a whitepaper for the need for airborne router.

Agenda Item 7. Plans for Next Meetings

Decision 7: P24 meeting is October 23 - 27 noon, 2017, at MITRE

Decision 8: P25 meeting is December 4 – 8 noon, 2017, at RTCA

Decision 9: P26 meeting is March 5 -9, 2018 (Location TBD)

Agenda Item 8. Review of Action Items and Meeting Summary

Dongsong Zeng, MITRE, presented the out-briefing (SC-223 IPS Meeting OutBriefing_8_2017.pptx) which summarizes all the decisions and action items that were made in this meeting. The work group reviewed and agreed on all the decisions and action items recorded in the out-briefing.

Agenda Item 9. Adjourn

The meeting adjourned at noon, Friday, August 25, 2017.

List of Action Items

Action Item #	Action Content	Responsible	Due Date	Status
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P18-1	Add ARINC658, DO-350a, DO-351a, DO-352a, and DO-353a to the initial documents in TOR	Aloke Roy	August 17, 2016	Closed - 11/2016 8/2016 - Draft done, need to present to next PMC
P18-2	Inform us about SESAR IPS related projects	Antonio Correias	August 17, 2016	Closed - 11/2016
P18-3	Check with FAA about GA participation in IPS data communication and FAA data communication safety and security assessment and requirements	Brent Phillips	August 17, 2016	Open 8/2016 - AeroMACS security was just completed, IPS security will leverage that later. 2/2017 - Keep open 5/2/2017 - Keep open, SC-216 draft document says single layer security may be adequate. 8/21/2017 - Keep open.
P18-4	Provide communication related system level safety analyses	Bruce Eckstein	August 17, 2016	Closed 8/2016 - Reference to DO-350a for operational safety analysis will satisfy the intent of this action item. SSA-lite was a limited report, not to be used as system safety analysis.
P18-5	Conduct the safety analysis (IPS use for safety and regularity of flight domain) for IPS and provide the Design Assurance Level (DAL) for IPS	David Robinson, Brent Phillips, FAA	August 17, 2016	Open 8/2016 - Start with safety assessment, then decide DAL. 2/2017 - Open. 5/2/2017 - Not aircraft certification office responsibility, David to check with UAS. 8/21/2017 - keep open.
P18-6	Inform ICAO WG-I about ICAO Doc9896 Section 2.2 Link Layer Requirements, in which interface requirements should not be local issues	Aloke Roy	Next WG-I meeting in May 2016	Open 8/2016 - Will be presented at December meeting 2/2017 - Closed
P18-7	Generate a work sheet of RFC list	Dongsong Zeng	August 17, 2016	Closed - 8/2016
P18-8	Check with SC-206 for the needs of IP services like FTP, Telnet, SNMP, etc.	Aloke Roy	August 17, 2016	Open 8/2016 - Will start a new ISRA with SC-206 2/2017 - the formal ISRA should be developed by SC-206 if this is needed. 5/2/2017 - CLOSED. Checked with A/G SWIM, no IP service needs.
P18-9	Check whether RFC 2488 Enhancing TCP over Satellite Channels is needed by IPS	Danny Bharj and David Robinson	August 17, 2016	Open 2/2017 - Inmarsat is looking at the draft from David. Boeing is proposing an updated UDP to ICAO WG-I. 5/2/2017 - CLOSED
P18-10	Continue coordinating with EUROCAE about global harmonization and EUROCAE participation in IPS standardization	Aloke Roy and Brent Phillips	August 17, 2016	Open 8/2016 - On going 11/2016 - On going

				2/2017 – EUROCAE is waiting for AEEC IPS roadmap completed. 5/2/2017 – CLOSED. AEEC road will not complete until Oct 2017, we decided to proceed with SC-223 plan.
P18-11	Bring the TOR schedule modification request to next PMC for approval	Aloke Roy	Next PMC meeting in June 2016	Closed – 11/2016 8/2016 – Will present to September meeting
P18-12	Reach out to NIST for the latest version of USGv6 on the profile for IPv6 in US Government	Brent Phillips	August 17, 2016	Open 8/2016 - On going 2/2017 – Closed.
P18-13	Identify any other profiles that can be shared in the group	All SC-223 members	August 17, 2016	Open 11/2016 - On going 2/2017 – Closed. Company profiles are not releasable.
P18-14	Draft a working paper for ICAO WG-I on the scope and function of IPS based on USGv6_v1 structure	Aloke Roy	August 17, 2016	Open 8/2016 - next WG-I meeting in December 2/2017 – Closed.
P18-15	Coordinate with SC-222 about SATCOM providers' participation	Aloke Roy and David Robinson	August 17, 2016	Closed 8/2016 - Ann Heinke will participate SC-223
P18-16	Members are invited to develop profiles for RFCs that are within the scope and bring to the next meeting as a strawman proposal	All SC-223 members	August 17, 2016	Closed - 8/2016
P18-17	Develop initial draft profile for RFC 768 User Datagram Protocol, August 1980	Dongsong Zeng	August 17, 2016	Closed - 8/2016
P18-18	Develop initial draft profile for RFC 791 Internet Protocol	Paul Mettus and Aloke Roy	August 17, 2016	Closed - 8/2016
P18-19	Develop initial draft profile for RFC 793 Transmission Control Protocol (TCP), September 1981	Bruce Eckstein and Antonio Correas	August 17, 2016	Closed - 8/2016
P19-1	Review the draft RFC profiles and provide comments before next meeting	All members	November 8, 2016	11/2016 - On going 2/2017 – on going 5/2/2017 – CLOSED.
P19-2	Identify IPv6 functions and corresponding RFCs, on the basis of the Appendix C: Requirements Summary Table in the file <i>disr_ipv6_profile_version_6_july_2011.pdf</i> , with consideration of NIST USGv6_v1 document and RFC6434. Task group reports findings from DoD IPv6 Profile at the next telecon.	Paul Mettus, Antonio Correas, Madhu Niraula, and Dongsong Zeng	November 8, 2016	Closed – 11/2016
P19-3	Restructure the workspace to set up working folder and final folder	Dongsong Zeng and Rebecca Morrison	November 8, 2016	Closed – 11/2016
P19-4	Explore FTI documents on IPv6 profiles and test procedures	FAA, David Robinson and Brent Phillips	November 8, 2016	On going 2/2017 – David is working on the NDA with FTI. On going. 5/2/2017 – on going.

				8/21/2017 – new FTI manager selected. Brent reached out to Andy. Material received, working on approval to release. Keep open
P19-5	From SC-223 perspective, there is no need to develop ISRA with SC-222. SC-223 TOR requires definition of the subnet user interface and generic subnetwork performance requirements. It is not the responsibility of SC-223 to allocate RCTP to each specific subnetwork.	Aloke Roy	November 8, 2016	Closed – 11/2016
P20-1	Investigate Cisco RFC implementation for IP over SATCOM	Rafael Apaza and David Robinson	Feb 28, 2017	2/2017 – on going. 5/2/2017 – Nothing special identified in current SATCOM trials. Ongoing. 8/21/2017 – keep open
P20-2	Check with FAA infrastructure people about how to use A/G capabilities of IPS. Would FAA use the IPS Profiles in the infrastructure procurement?	Aloke Roy and Brent Phillips (Andy Isaksen)	Feb 28, 2017	2/2017 – Open 5/2/2017 – Keep open. Would FTI 2 refer to IPS Profiles? 8/21/2017 – keep open
P20-3	Draft initial high level diagram of a generic network architecture for IPS	Madhu Niraula	Feb 28, 2017	2/2017 – Closed. Feb 28 review, and will be available on the workspace.
P20-4	Add notes to elaborate the required RFCs	Tiger team	Feb 28, 2017	2/2017 – Closed.
P20-5	Expand the high-level profile for IPS	Tiger Team	Feb 28, 2017	2/2017 – Closed.
P20-6	Present the updated TOR to PMC	Brent Phillips	Feb 28, 2017	2/2017 – Closed.
P20-7	Present a working paper to WG-I with RFC recommendations and profile for RFC2460 and RFC2474	Aloke Roy and Dongsong Zeng	Feb 28, 2017	2/2017 – Closed.
P20-8	Present Gap analysis comments to AEEC IPS	Brent Phillips and Dongsong Zeng	Feb 28, 2017	2/2017 – Closed.
P20-9	Develop use case based on existing vulnerability analysis for FTI and AeroMACS	David Robinson	Feb 28, 2017	2/2017 – On going. 5/2/2017 – keep open. 8/21/2017 – keep open.
P21-1	Add RFC 7296, 7427, 7670 1034, 1035, 1123, 2181 to high level profile.	Dongsong Zeng	May 2, 2018	5/2/2017 – CLOSED
P21-2	Draft detail profiles for RFC 2460, 5795, 6846, 5225, 3095, and 4815.	Paul Mettus	May 2, 2018	5/2/2017 – Keep open 8/21/2017 – in progress
P21-3	Draft detail profiles for RFC 4443, and 4861.	Mudhu Niraula	May 2, 2018	5/2/2017 – CLOSED.
P21-4	Draft detail profiles for RFC 4862, 4429, 4291, 2474, 2475, 2597, and 3246.	Aloke Roy	May 2, 2018	5/2/2017 – keep open 8/21/2017 – In progress.
P21-5	Refine detail profiles for RFC 2464, 5175, and 768.	Dongsong Zeng	May 2, 2018	5/2/2017 – CLOSED.
P21-6	RFC 3411, 3412, 3413 (SNMP low priority) to be assigned.	All members	May 2, 2018	5/2/2017 – keep open 8/21/2017 – keep open

P21-7	Draft detail profiles for RFC 1151 (RDP), and 7542 (NAI).	Antonio Correas	May 2, 2018	5/2/2017 – CLOSED
P21-8	Initiate the IPS system overview and use cases	Aloke Roy, Rafael Apaza, Antonio Correas and Dongsong Zeng	May 2, 2018	5/2/2017 – in progress 8/21/2017 – in progress
P21-9	Merge the two high level profiles and draft the working paper for next WG-I meeting	Dongsong Zeng	May 2, 2018	5/2/2017 – CLOSED
P21-10	Investigate the tradeoffs of SCTP, RDP, UDP and TCP.	Dongsong Zeng and Antonio Correas	May 2, 2018	5/2/2017 – CLOSED
P21-11	Identify DNS related RFCs and develop use cases.	Rafael Apaza	May 2, 2018	5/2/2017 – keep open. 8/21/2017 – Closed
P22-1	Develop DNS use case	Rafael Apaza	August 21, 2017	8/21/2017 – Closed, subject to group review.
P22-2	Develop general connection establishment, data flow and mobility use case	Mudhu Niraula	August 21, 2017	8/21/2017 – keep open
P22-3	Develop general security use case	Mudhu Niraula	August 21, 2017	8/21/2017 – keep open
P22-4	Develop multi-link use case	Antonio Correas and Dongsong Zeng	August 21, 2017	8/21/2017 – Closed, subject to group review.
P22-5	Generate mapping table between WG-I requirements and derive requirements to identify gaps	Aloke Roy	August 21, 2017	8/21/2017 – Closed, overtaken by events. We will address it through use cases development
P22-6	Develop initial Profile and MOPS outline	Aloke Roy	August 21, 2017	8/21/2017 – Closed. Profile draft is done, MOPS outline can be deferred to later time.
P22-7	Place/organize the approved profiles on the work space	Dongsong Zeng	August 21, 2017	8/21/2017 – Closed.
P23-1	Explore subnetwork point of attachment (SNPA) addresses for aircraft.	Aloke Roy	October 23, 2017	
P23-2	Explore how many subnets typical DSPs have.	Madhu Niraula	October 23, 2017	
P23-3	Explore how many subnets FAA enterprise has.	Brent Phillips	October 23, 2017	
P23-4	Explore how many subnets PAN European enterprise has.	Danny Bharj	October 23, 2017	
P23-5	Review what is available in the IETF for multilink.	Antonio Correas, Madhu Niraula, Dongsong Zeng	October 23, 2017	
P23-6	Flesh out the IPS CONOPS text.	Dongsong Zeng	October 23, 2017	
P23-7	Investigate the CRCs of ROHC at system level.	Aloke Roy	October 23, 2017	

P23-8	Review the existing RFC detail profiles for 5795, 4861, 2597, 3260, 2474, 3246 and provide comments before next telecon.	All member	October 23, 2017	
P23-9	Identify what criteria are needed for link selection.	Antonio Correas	October 23, 2017	
P23-10	generate a whitepaper for the need for airborne router.	Madhu Niraula	October 23, 2017	

-S-
Dongsong Zeng
Secretary

CERTIFIED as a true and accurate summary of the meeting.

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Aloke Roy
Chairman