International Civil Aviation Organization

Second Meeting of the Surveillance Study Group (SURSG/2)

Video Tele-Conference (VTC), 15 - 17 March 2022

Agenda Item 5: States' experience for Surveillance data sharing

FUTURISTIC TELECOMMUNICATION INFRASTRUCTURE (FTI) IMPLEMENTATION IN INDIA.

(Presented by INDIA)

SUMMARY

This paper presents brief about implementation of Futuristic Telecommunication infrastructure (FTI) in India for sharing Surveillance data.

1. INTRODUCTION

1.1 India is the one of the largest aviation market in the world today and is strategically located in Asia-Pacific region sharing its boundary with fourteen neighbouring countries. India has been crafting best ways to handle rising air traffic with utmost ease. By progressive promulgation of efficient and green routes through RNP 2, India is going to be a major aviation hub in this region.

1.2 As one of the world's fastest growing aviation markets, India handles more than 190 million passengers, which is expected to double to 337 million domestic and 84 million international passengers over the next decade. India's exponential air traffic growth is continuously creating demand for new aircraft, air navigation technologies, airport security equipment and infrastructure. To keep sync with this rapid growth, in May 2018, AAI awarded Harris Corporation, USA, a 15-year contract to provide the Futuristic Telecommunications Infrastructure, a nationwide telecommunication network to support air traffic management operations, with an emphasis on safety and high reliability and the ability to expand with growth. Harris Corporation, USA is now known as L3Harris Technologies.

1.3 As India continues to experience exponential growth in air traffic, new programs and technologies will be vital for Communication, Navigation and Surveillance/ Air Traffic Management. These modern programs and systems require much more communications bandwidth than what have been desirable in the past. Though, due to onset of the COVID-19 pandemic there is a degrowth in the worldwide aviation traffic including India, however it is expected to pick up the momentum at an accelerated pace as the pandemic is approaching the endemic state.

1.4 The preponderance of the present telecommunications network is composed of dedicated point-to-point circuits which are run by state owned Bharat Sanchar Nigam Limited

(BSNL) and other few service providers without stringent commitment on SLAs (Service Level Agreements) for availability and reliability of circuits for ATM applications. Moreover, older point-to-point MLLN (Managed Leased Line Networks) telecom infrastructure is being replaced by modern MPLS cloud based infrastructure at a rapid pace. This has resulted in Network Managed services gaining importance across globe and also in India to overcome such handicaps.

2. DISCUSSION

2.1 By using a single managed service network like FTI, AAI will be able to consolidate the communications budgets from all planned future projects onto a single FTI network and only have to incur the incremental costs of a shared network. The FTI network will not only provide service for upcoming sites and programs, but all existing data communications services managed by AAI will be moved over to this network and will be covered under the agreed SLAs.

2.2 The FTI network provides equipment at each AAI site to support the migration of all existing AAI communications circuits to the FTI network. This equipment provides AAI with dedicated circuit bandwidth through dual MPLS clouds from two different Telcos and multiplexes all of the communication circuits at a site onto bulk bandwidth communications transport circuits. All FTI sites have two separate sets of equipment and a proprietary hardware of L3Harris Technologies, NRB-1000, allowing seamless availability of FTI services in the event of a telecom circuit failure of any one of the two telecom service providers.

2.3 FTI Network provides high availability SLA based Telecommunication links with availability parameters ranging from 99.9% to 99.99% using Latest Technology equipment and communications infrastructure at about 90 AAI locations. All Surveillance services on FTI have Service Level Agreement (SLA) targets of 99.99% availability. Till date a total of 41 (30 RADAR; 11 ADS-B) surveillance services have been deployed on FTI and are almost meeting the targeted SLAs.

3. Network Operations Control Centre (NOCC)

3.1 The Network Operations Control Centre for AAI FTI through its monitoring and controlling abilities significantly enhances communications and network availability, reliability and security commensurate with India’s fast-growing air traffic. FTI network represents AAI’s largest services-based implementation.

3.2 A central network management approach reduces overhead costs by combining many areas of expertise into a single cohesive workgroup. When this SLA based communication infrastructure is in place, AAI can leverage its investment in the Network to reduce costs and improve efficiency through innovative application of network benefits to other stakeholders without having to compromise operational stability and safety. Network management, design, provisioning, maintenance, and deployment engineers work together with business office, analysts, and program management in the same location, creating synergies of expertise and communications, resulting in efficient network operations and Service is available 24 X 7 X 365.

3.3 Disaster Recovery Site has been established at Bengaluru to recover and restore its technology infrastructure and operation in case of failure of primary infrastructure.

4. Futuristic Vision

4.1 The state-of-the-art Primary Network Operation Control Centre (PNOCC) and Primary Security Operation Control Centre (PSOCC) are co-located with AAI's Northern Region headquarters and is supported by a redundant, robust architecture housed within the facility. This dedicated, round-the-clock centre allows the staff to handle virtually all communications requirements, including automated problem reporting and real-time network status for AAI.

4.2 Performance of all telecommunication links is continuously monitored at NOCC at Delhi and Bangalore for various performance parameters to meet the global ATM application performance requirement. All Telecommunication links and each network equipment are centrally monitored 24*7 for immediate response to fix any outages. Security Operation Control Centre (SOCC) at Delhi and Bangalore protect the network from cyber threats. All service connections and each equipment are security hardened, monitored, and safeguarded against intrusion with constant system updates against latest security threats.

4.3 Physical building security, redundant climate control systems, and uninterruptible power sources ensure system and facility availability with virtually zero downtime while security features such as firewalls, Intrusion Detection/Prevention System (IDS/IPS) and Security Information and Event Management (SIEM) to safeguard the network security.

*In the long run, the implementation of FTI network would result in enhanced Air Traffic **safety, increased airspace capacity** by allowing the controllers to **reduce the separation standards** and accommodating the aircrafts to **more economical and environment friendly flight levels** thus reducing the overall carbon footprint.*

5. ACTION BY THE MEETING

5.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matter as appropriate

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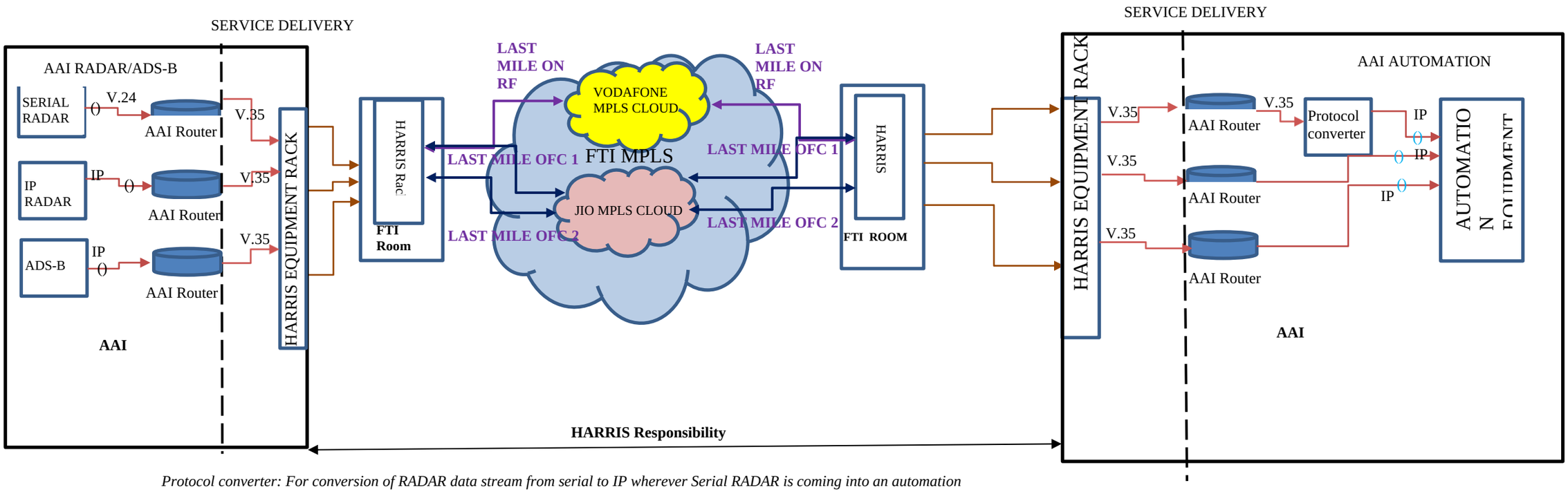
HIGH LEVEL DIAGRAM DEPICTING DATA FLOW FOR RADAR/ADS-B SERVICES IN FTI NETWORK



Protocol converter: For conversion of RADAR data stream from serial to IP wherever Serial RADAR is coming into an automation

() *Combiner/switch may be placed if required, to handover a single stream to AAI Router/FTI*

() *Splitter/switch may be placed if required, to handover dual stream to Automation from AAI Router/FTI*

AAI Router could be single port or multi-port on WAN/LAN side as deemed appropriate by the station