Interface Control Document for Interactive Advance Passenger Information and Push PNR

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National Immigration Administration

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TABLE OF CONTENTS

1. Introduction

1.1 Purpose

This document outlines the connectivity options for persons in charge of inbound/outbound aircraft or agencies handling the exit/entry business for aircraft (Hereinafter referred to as " aircraft carriers") to send iAPI and Push PNR data to the National Immigration Administration of China and Civil Aviation Administration of China (Hereinafter referred to as "NIAC" and "CAAC"). It serves as a reference guide for technical staff to meet the configuration requirement of production and testing environment.

Aircraft carriers are required to configure two environments:

1. Production environment: the production environment is used to send live production data.
2. Testing environment: the testing environment is used to do functional testing and get the certification for production.

1.2 Project Concept

Aircraft carriers are required to submit Advance Passenger Information (iAPI) in an interactive mode, and provide Passenger Name Record (PNR) data within the time prescribed in 147 decree.

1.2.1 iAPI

When the check-in process is handled by aircraft carriers, the passenger information should be submitted in real time to the address dedicated by NIAC and CAAC. And the feedback instruction also should be received in real time. The passenger information that submitted by aircraft carriers will go through the pre-inspection in NIAC. The feedback will be sent back to notify whether the boarding pass can be printed. Under special conditions, iAPI system will send an Unsolicited Message to change a passenger's vetting result. Aircraft carriers send flight close message to report passengers and crew members on board after the door are closed and prior to the flight's departure. Aircraft carriers also should report if the flight is canceled. The message functions and the interactive mode are listed in table 1. iAPI data will be transmitted via SITA network, refer to chapter 3.1 for protocol options.

Table 1 message and interactive mode

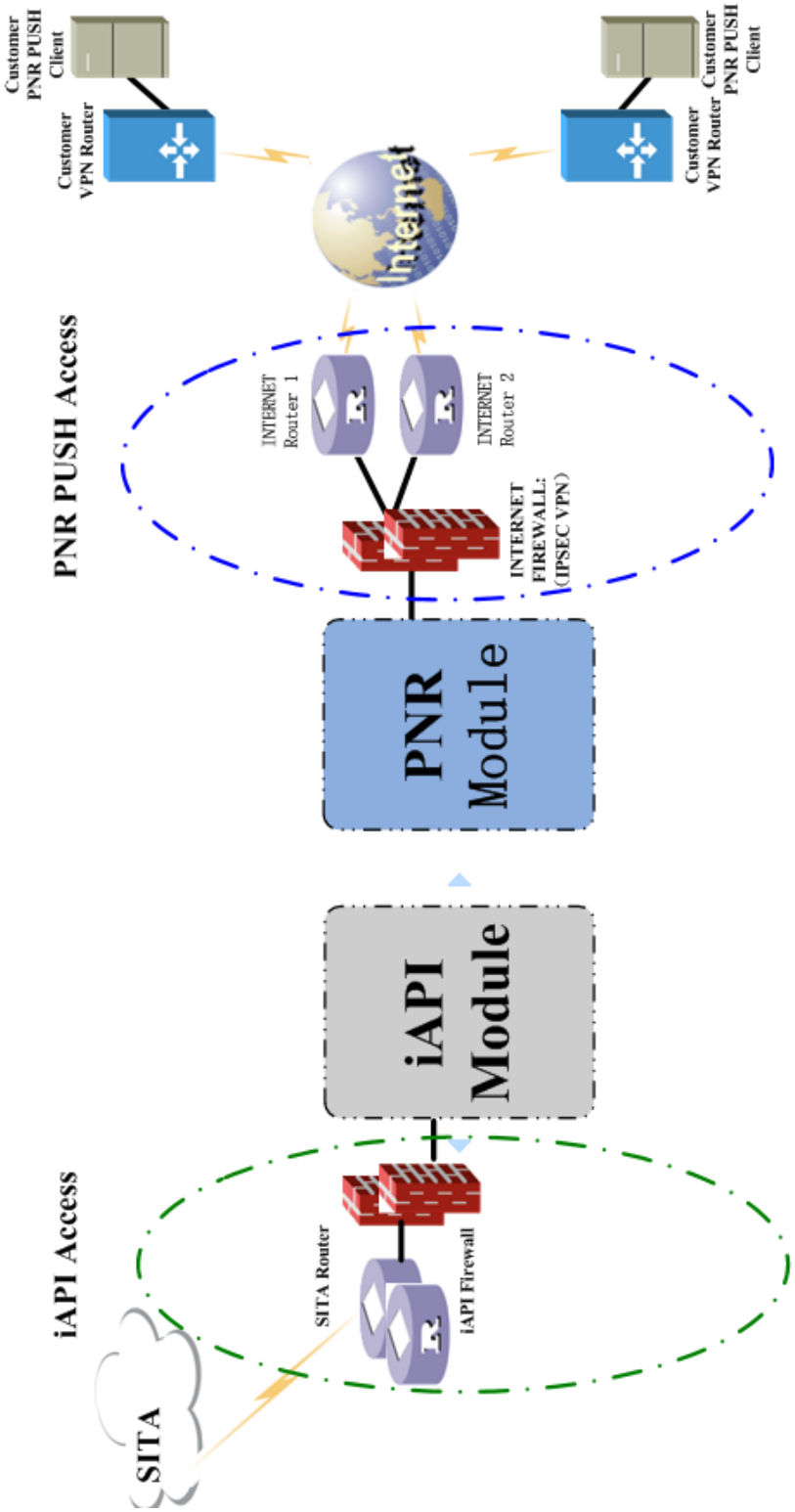
Functions	Request Message	Response Message	Synchronous or Asynchronous
Passenger data report and vetting response	PAXLST BGM+745	CUSRES BGM+962	Synchronous
Passenger Data Change and vetting response	PAXLST BGM+745+CP	CUSRES BGM+962	Synchronous
Passenger vetting status correction	CUSRES BGM+132	CUSRES BGM+312	Synchronous
Flight close-out	PAXLST BGM+266+ CLOB	CUSRES BGM+962	Asynchronous

	or BGM+266+ CLNB		
Flight cancellation	PAXLST BGM+266+ XF	CUSRES BGM+962	Asynchronous

1.2.2 PNR

The reservation information is contained in a Passenger Name Record (PNR), which usually resides in an aircraft carriers' Reservation System (RES). DCS (Check-in) information is gathered at the time of passenger check-in. The check-in information usually resides in the aircraft carriers' Departure Control System (DCS) or in another DCS handling the check-in operations for the flight. Aircraft carriers should provide PNR and DCS data to CAAC and NIAC for all international flights to or from the mainland of China, including transit flights. PNR data will be transmitted via Internet network, refer to chapter 3.2 for protocol description.

2. Network Diagrams



3. Interface Introduction

3.1 iAPI

Network connectivity is provided via a SITA connection per aircraft carriers. The messages and transmitting mode are listed in table 2. Details on the configurations of the network and MQ/MATIP should be discussed with iAPI project team on a case-by-case basis.

Table 2 Message and Transmitting Mode

Functions	MATIP	Queue
Passenger data report and vetting response	Type-A	HPQ
Change Passenger Data and vetting response	Type-A	HPQ
Passenger vetting status correction	Type-A	HPQ
Functions	**SITA TYPE-B**	**Queue**
Flight close-out	Type-B	LPQ
Flight cancellation	Type-B	LPQ

Note: HPQ is IBM MQ high priority queue;
LPQ is IBM MQ low priority queue.

3.1.1 MATIP [1]

The iAPI system will be the Server for communication with aircraft carriers. In other words, Airlines will establish the connections with the iAPI system. Type-A, limited assurance query/reply messages will be supported across designated connections with aircraft carriers or the iAPI system initiating queries and issuing replies. The iAPI system may transmit traffic destined only for aircraft carriers over these connections. Aircraft carriers may transmit traffic destined only for the iAPI system over these connections.

MATIP is the preferred agreement in the field of International Airline Transport. The International Airline Transport Association (IATA) Host to Host (HTH) protocol is used for all Type-A messages. HTH control and reject messages are not used. For queries, the TPR is returned intact with the subsequent reply. Replies are always returned to the original connection.

Hardcopy, conventional (full assurance) or message switching traffic types will not be supported by Type-A connections.

3.1.1.1 TCP/IP Parameters

Production

iAPI system IP	Port	MPX	HDR	Flow ID
122.119.51.11	350	2	2	NO

Testing

iAPI system IP	Port	MPX	HDR	Flow ID
122.119.66.2	350	2	2	NO

[1] MATIP see IETF RFC2351 https://www.rfc-editor.org/info/rfc2351

3.1.1.2 Type-A HTH Header

The following chart indicates the various connections to be used for Type-A messages between the aircraft carriers and the iAPI system. The IATA HTH Layer 5 QRI, E1/I1, and TPR values are listed below as well as layer 6 values.
The Type-A Query / Reply example that follows below will use one of the functional traffic sets as a model to fill in the values.

Layer 5			
QRI 1-7	**the aircraft carriers system**	**iAPI Addr**	**TPR**
VHLG.W		**CNIAPI**	**P+8**
Layer 6			
VGYA			

The following shows an example of the HTH TCP/IP Headers as they will be used for the implementation of the connections. One set of HTH values from the table in section 2.3.1 will be used for the examples. The appropriate header will be appended as a prefix to each data transmission per functional connection. The 'E1' value will indicate the Source Address while the 'I1' value will indicate the Destination Address. The Source or Destination address may be present in the 'Addr. 1' or 'Addr. 2' field.

HTH layer 4: V.cr
HTH layer 5:
GFI: V
QRI: HLG.W'D' indicates a reply
Delimiter: /
Addr. 1: E1XXIAPIQ
Delimiter: /
Addr. 2 : I1CNIAPI
Delimiter: /
TPR: P+8 free form field used to match a reply to a query
Delimiter: cr
HTH layer 6: VGYAcr
Data: Applications Data
cr = Carriage Return = 0x0D

3.1.1.3 Code Set

The HTH header for Type-A is encoded in the ASCII code-set.
All application data message text is encoded in the ASCII code-set.

3.1.2 IBM MQ

3.1.2.1 Introduction

IBM WebSphere MQ is used to assure delivery of messages between different systems and their associated platforms, and the only supported connection is MQ Server to MQ server. Each aircraft carriers will be provided with their own MQ set-up.

3.1.2.2 MQ Message Requirements

Attribute	Requirement
Message Correlation ID	Any code, it is recommended to enter the airline code (2 alphanumeric characters given by IATA).
Message Body	iAPI DATA

3.1.2.3 MQ Parameter Limit

MQ message body cannot be over 512KB.
MQ version needs to support version 7.5 or above.

3.1.2.4 MQ Connection Details

	Aircraft carriers system			iAPI system		
	IP Address	**Port**	**Queue Manager Name**	**IP Address**	**Port**	**Queue Manager Name**
Testing				122.119.52.27	6868	QM_CNIAPI
Production				122.119.52.26	6868	QM_CNIAPI

3.1.2.5 MQ Channels and Queue Information

High Priority Queue：
This type of queue is only for the real-time, interactive, repeatable access messages. It means that the request must get a response within a certain time. If the sender gets a reply time-out, he can make a new request again. The following shows the MQ configuration of the request and the response between aircraft carriers and the authority.

Aircraft carriers system to iAPI system:

Organization	Testing	Production
Aircraft carriers system		
Channel Name(Sender)		
Remote Queue Name		
iAPI system		
Channel Name(Receiver)	CHA_%_TO_CN_HRECV	CHA_%_TO_CN_HRECV
Local Queue Name	L_CN_GET_%_IAPI_HPQ	L_CN_GET_%_IAPI_HPQ
Instruction Manual	% represents the airline name. Normally, it is a two-word code compiled by IATA. Taking Air China as an example, the corresponding channel name (receiver) and local queue information are CHA_CA_TO_CN_HRECV and L_CN_GET_CA_IAPI_HPQ. For airline carrier systems, their channel name (sender) should be related to the channel name (receiver) of the iAPI system, and their telematics queue name should be related to the local queue information of the iAPI system. Air carrier carriers are required to comply with the above rules.	

iAPI system to aircraft carriers system:

Organization	Testing	Production
Aircraft carriers system		
Channel Name(Receiver)		
Local Queue Name		
iAPI system		
Channel Name(Sender)	CHA_CN_TO_%_HSEND	CHA_CN_TO_%_HSEND
Remote Queue Name	R_CN_TO_%_IAPI_HPQ	R_CN_TO_%_IAPI_HPQ
Instruction Manual	% represents the airline name. Normally, it is a two-word code compiled by IATA. Taking Air China as an example, the corresponding channel name (receiver) and local queue information are CHA_CN_TO_CA_HSEND and R_CN_TO_CA_IAPI_HPQ. For airline carrier systems, their channel name (recipient) should be related to the channel name (sender) of the iAPI system, and their local queue information should be related to the iNode system's telematics name. Air carrier carriers are required to comply with the above rules.	

Low Priority Queue：

This type of queue is for the non-real-time, non-interactive, unidirectional messages. It is just the request and has no response.

Aircraft carriers system to iAPI system:

Organization	Testing	Production
Aircraft carriers system		
Channel Name(Sender)		

Remote Queue Name		
iAPI system		
Channel Name(Receiver)	CHA_%_TO_CN_LRECV	CHA_%_TO_CN_LRECV
Local Queue Name	L_CN_IAPI_LPQ	L_CN_IAPI_LPQ

3.1.3 SITA Type-B

Flight close-out and Flight cancellation messages can be sent to the IATA Type-B addresses, and the Type-B addresses are as follows:

Production	Testing
PEKZG1E	PEKZT1E

3.2 PNR

3.2.1 PNR Network Access Criteria

Network connectivity to the PNR system is provided through IPsec VPN connection per aircraft carriers. The specifications below need to be followed. Other authentication methods should be discussed case by case.

3.2.2 IPsec VPN Configuration

The aircraft carriers will be issued with two separate Pre-Shared Keys, one for the testing environment and the other for the production environment and will be exchanged with E-mail. These will be used to establish the VPN connection to the respective PNR systems. The aircraft carriers will require an IPSec end point to establish a VPN connection.

3.2.2.1 VPN Peer Information

Environment	Peer A (PNR system)	Peer B (Aircraft carriers system)
Testing		
IP Address	122.119.73.16	
Production		
IP Address	122.119.73.16	

3.2.2.2 Phase-1 (ISAKMP) Properties

Parameter	Value

Encryption	AES-256
Data Integrity	SHA256
Authentication Method **Pre-shared Secret**	Via mail
Aggressive Mode	Disabled
Diffe-Helmen Group	Group 20

3.2.2.3 Phase-2 (IPSEC) Properties

Parameter	Value
Encapsulation	ESP
Encryption	AES-256
Data Integrity	SHA256
Perfect Forward Secrecy (PFS)	Enabled
Diffe-Helmen Group	Group 20

3.2.2.4 VPN Domain

IP (range(s), networks or hosts)	Peer A (PNR system)	Peer B (Aircraft carriers system)
Testing		
IP (range(s), network or hosts) transported	122.119.122.69/32	should be public address(INTERNET)
Production		
IP (range(s), network or hosts) transported	122.119.122.68/32	should be public address(INTERNET)

3.2.2.5 Security Policy Rules

Environment	Source	Destination	Service
Testing	Aircraft carriers system	122.119.122.69/32	TCP.1422
Production	Aircraft carriers system	122.119.122.68/32	TCP.1422

3.2.3 IBM MQ

3.2.3.1 Introduction

IBM WebSphere MQ is used to assure delivery of messages between different systems and their associated platforms, and the only supported connection is MQ Server to MQ server. Each aircraft carrier will be provided with their own MQ set-up.

3.2.3.2 MQ Message Requirements

Attribute	Requirement
Message Correlation ID	Any code, it is recommended to enter the airline code (2 alphanumeric characters given by IATA). e.g. 'CA' for Air China.
Message Body	PNR DATA

3.2.3.3 MQ Parameter Limit

MQ message body cannot be over 512KB.
MQ version needs to support version 7.5 or above.

3.2.3.4 MQ Connection Details

IP Connectivity

Traffic Type	aircraft carriers system		PNR system	
	IP Address	Port	IP Address	Port
Testing				
PNR Incoming			122.119.12.155	6769
Production				
PNR Incoming			122.119.12.154	6769

MQ Channels

Organization	Test	Production
aircraft carriers system		
Queue Manager		
Channel Name(Sender)		
Remote Queue Name		
PNR system		
Queue Manager	QM_CNPNR	QM_CNPNR
Channel Name(Receiver)	S_CNPNR_RECV	S_CNPNR_RECV
Local Queue Name	QL_CNPNR	QL_CNPNR