



*International Civil Aviation Organization*

## **Fourth ATN Transition Task Force Meeting**

Mumbai, India, 8 - 12 April 2002

### **Agenda Item 2: Develop ATN Interface Control Documents**

## **GUIDANCE FOR THE SPECIFICATION BETWEEN END SYSTEM AND INTERMEDIATE SYSTEM**

(Presented by Japan)

### **Summary**

This paper presents guidance for the specification between ATN End System (ES) and ATN Intermediate System (IS). ICAO ATNP specifies the specification as a local matter, since it is purely implementation nature and it does not affect the interoperability of international communications. However, it was pointed out that some guideline was necessary at the Fourth Working Group B Meeting of ATN TTF on 10 December 2001 in Chiang Mai. The meeting is invited to note the information provided in this paper.

## **1. Introduction**

1.1 ICAO ATNP specifies the specification between End System (ES) and Intermediate System (IS) as a local matter, since it is purely implementation nature and it does not affect the interoperability of international communications. Regional Interface Control Documents (ICDs) are developing in the Asia/Pacific region based on the ICAO ATN SARPs, therefore they do not include the specification between ES and IS.

Figure 1 shows the scope of AMHS ICD and ATN Router ICD on the protocol stack of ISO OSI Seven Layers. As indicated in Figure 2, the specification between ES and IS is for the layers of Network, Data Link and Physical.

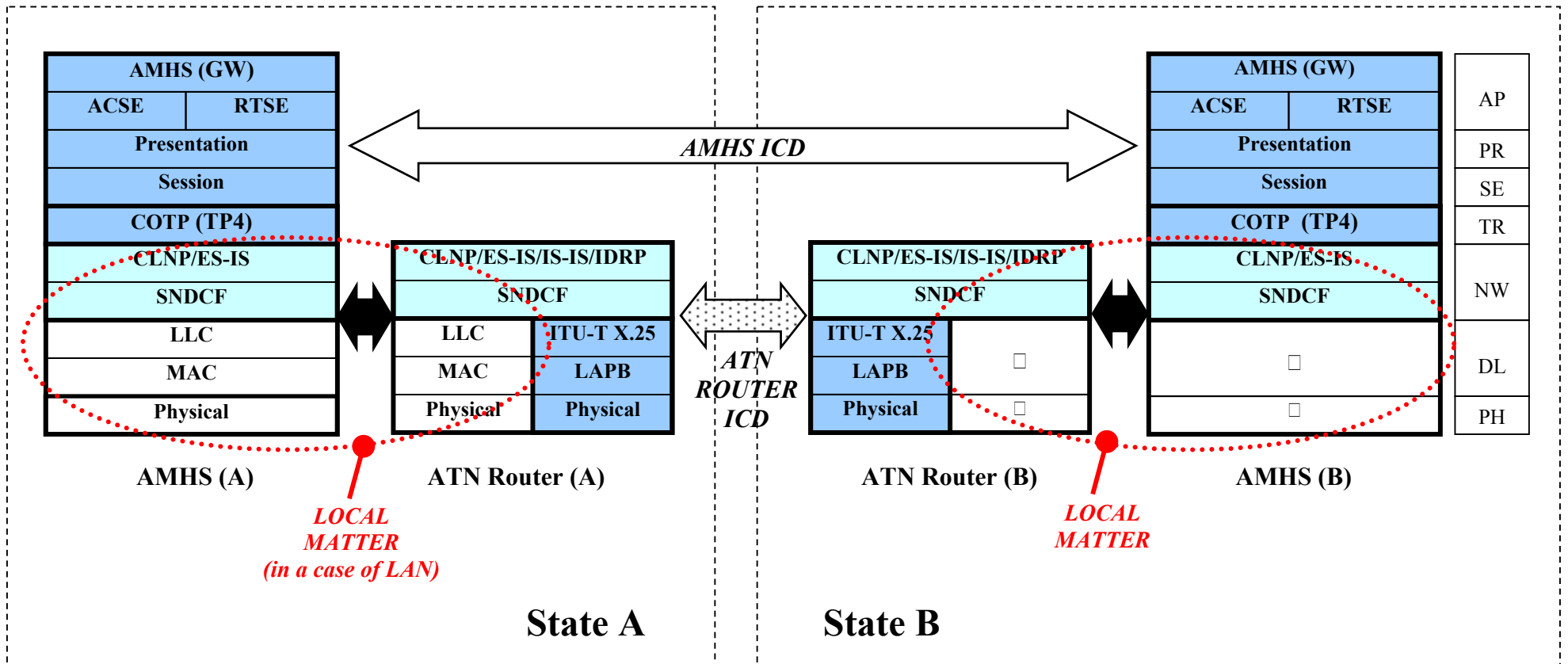
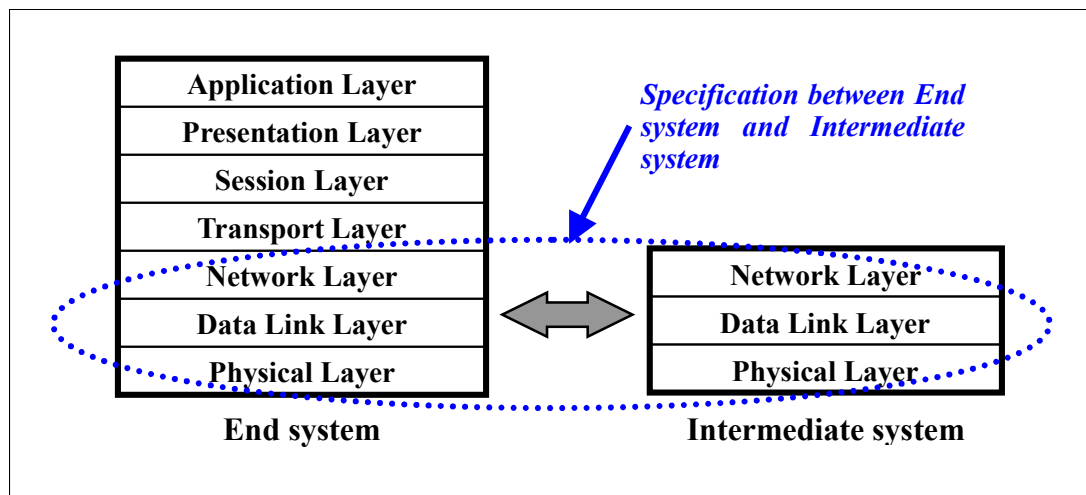


Figure 1. Scope of ICDs



**Figure 2. OSI Layer**

1.2 It was pointed out that the specification between ES and IS should be included in the ICD during discussion on the AMHS ICD at Fourth Working Group B Meeting of ATN TTF on 10 December 2001 in Chiang Mai. Considering the nature of ICD, the meeting concluded to discuss the specification between ES and IS separating from the ICDs.

1.3 Guidance on the specification was developed and presented in the next Clause 2.

## **2. Discussion**

The following description is one of examples for the specification between End System (e.g. AMHS) and Intermediate System (e.g. ATN Router).

### **2.1 Precondition**

It is the precondition that End System and Intermediate System shall comply with the ICAO ATN SARPs and the regional ICDs (AMHS ICD and ATN Router ICD).

### **2.2 Protocol**

In order to specify the specification between End System and Intermediate System, it is needed to consider the following two (2) items:

- a) Subnetwork
- b) Routing Protocol

#### **2.2.1 Subnetwork**

In the ICAO ATN SARPs, it is allowed to use various subnetworks (e.g. LAN, X.25, etc.) between End System and Intermediate System. The applied subnetwork will depend on the hardware specification of implemented systems in each country, however LAN as subnetwork is a typical example.

### 2.2.2 Routing Protocol

In order to communicate between End System and Intermediate System, the systems need to exchange routing information such as network address (e.g. NSAP) and subnetwork address (e.g. MAC address) each other. Therefore, routing protocol is needed to be installed both in End System and Intermediate System. The routing protocol is specified as ISO 9542 (ES-IS).

Figure 3 shows an example of protocol stack using LAN for subnetwork. The each layer is specified as follows:

1) Network Layer

- a) CLNP, ES-IS and SNDCEF are applied.

*NOTE: IS-IS and IDRP in IS are not related with the specification between ES and IS, and they are specified in the ICAO ATN SARPs as well as the ATN Router ICD.*

- b) The detailed specification of CLNP and SNDCEF is described in (and shall be comply with) the ICAO ATN SARPs.

- c) ES-IS shall comply with ISO 9542. There are some parameters to be coordinated between ES and IS; they are described in the next Clause 2.3.

2) Data Link Layer

- a) MAC (Media Access Control) and LLC (Logical Link Control) are applied.

*NOTE: No guidance is described here since it is a common technique.*

3) Physical Layer

- a) Physical Layer for LAN is applied.

*NOTE: No guidance is described here since it is a common technique.*

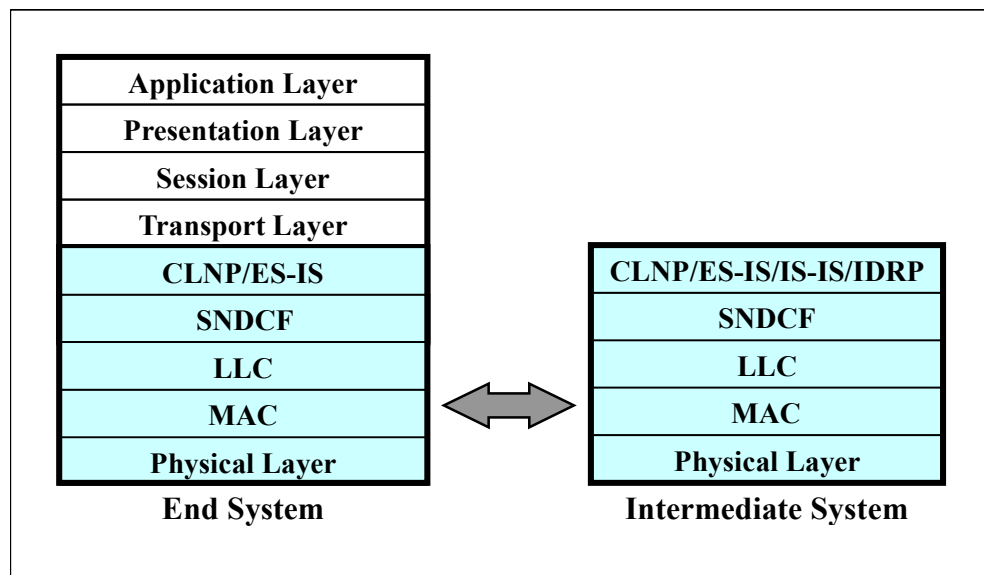


Figure 3. Protocol Stack using LAN

### 2.3 Parameters for ES-IS

The parameters stated in Table 1 are needed to coordinate between End System and Intermediate System.

Table 1. Parameters

| No. | Parameter                | Clause of ISO 9542 | Extract from ISO 9542                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----|--------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Configuration Timer (CT) | 6.1.1              | The Configuration Timer is a local timer (i.e. maintained independently by each system) which assists in performing the Report Configuration function (see 6.2). The timer determines how often a system reports its availability to the other systems on the same subnetwork. The shorter the Configuration Timer, the more quickly other systems on the subnetwork will become aware when the reporting system becomes available or unavailable. There is a trade off between increased responsiveness and increased use of resources in the subnetwork and in the recipient systems. |
| 2   | Holding Timer (HT)       | 6.1.2              | The Holding Timer applies to both configuration information and route redirection information. The value of a Holding Timer is set by the source of the information and transmitted in the Holding Time field of the appropriate PDU. The recipient of the information is expected to retain the information no longer than the Holding Timer. Old configuration or redirection information shall be discarded after the Holding Timer expires to ensure the correct operation of the protocol.                                                                                         |
|     |                          | 6.2.2              | The Holding Timer (HT) field is set to approximately twice the Intermediate System's Configuration Timer (CT) parameter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

### 3. Action by the Meeting

The meeting is invited to note the information provided in this paper.