International Civil Aviation Organization

REGIONAL WORKSHOP ON AMHS

AMHS
Detailed specifications

(Dakar, 28-29 May 2013)

Outline

- High level requirements
- ATS Message Service
- Validation performed
- Implementation plans
- Transition from AFTN or CIDIN to AMHS

AMHS: High level requirements

- Provide a messaging service over the ATN
- Deliver a level of service at least equivalent to that of the AFTN
- Allow transition from AFTN to ATN
- Allow transition from CIDIN to ATN

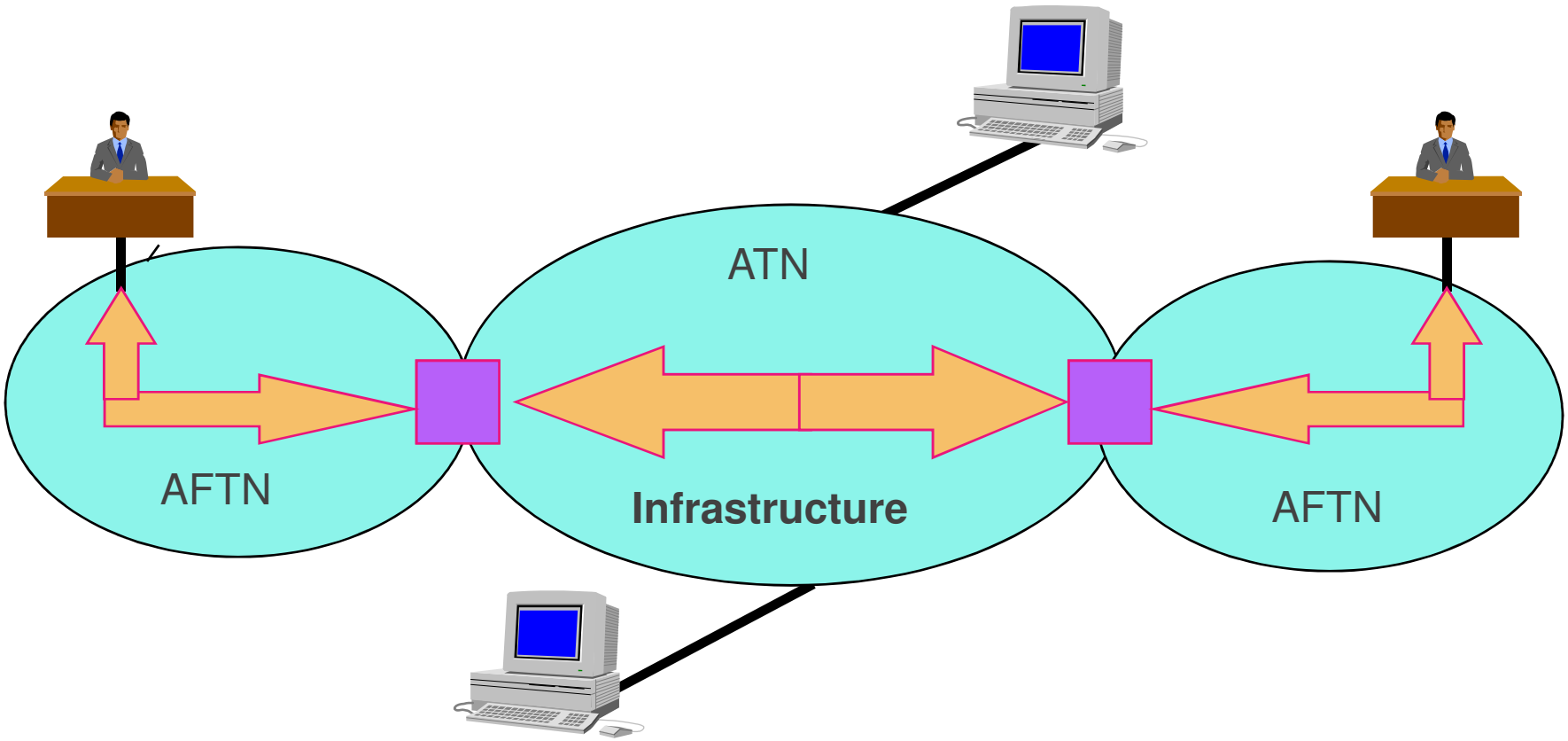
AMHS: AFTN Functionalities

- Store-and-forward messaging service ensuring no loss of messages
- 3 Transmission Priorities
- 5 Priority Indicators
- Multiple addressee messages
- Collective addresses
- Possibility to convey optional heading information

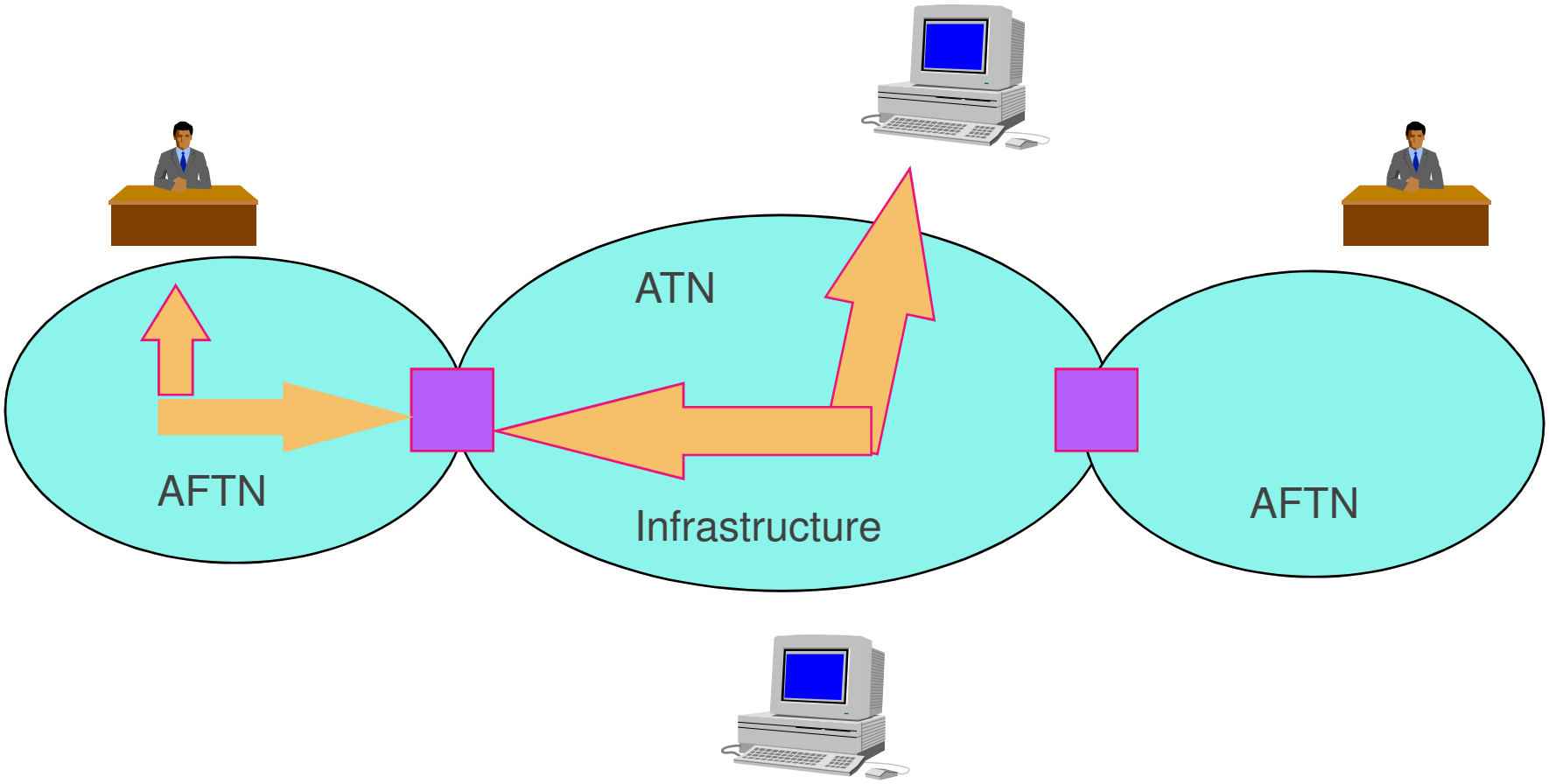
AMHS Summary

- Operational requirements
- MHS/X.400 Overview
- Definition of the ATS Message Service
- AMHS Components

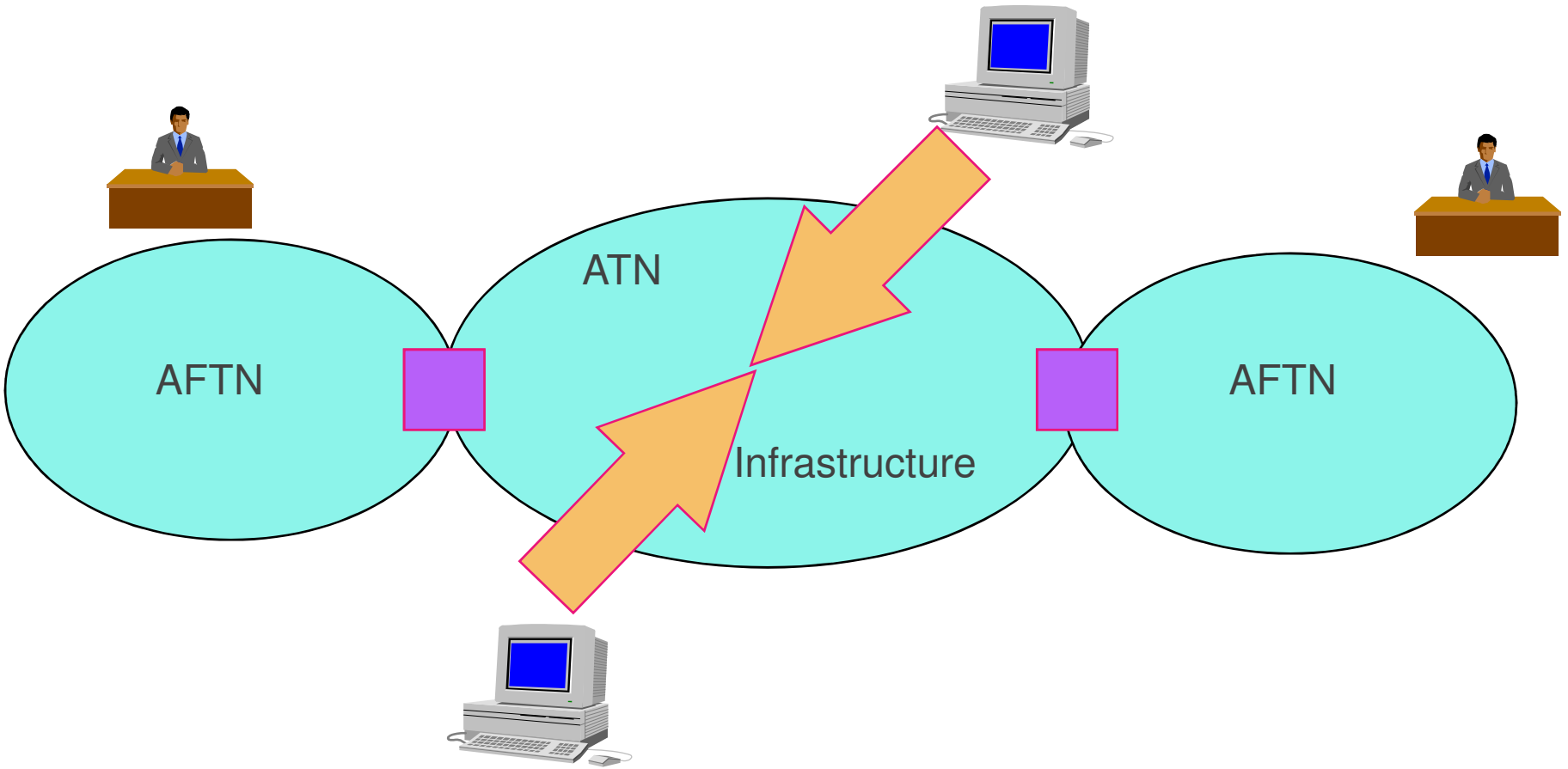
AMHS Operational requirements (1/4)



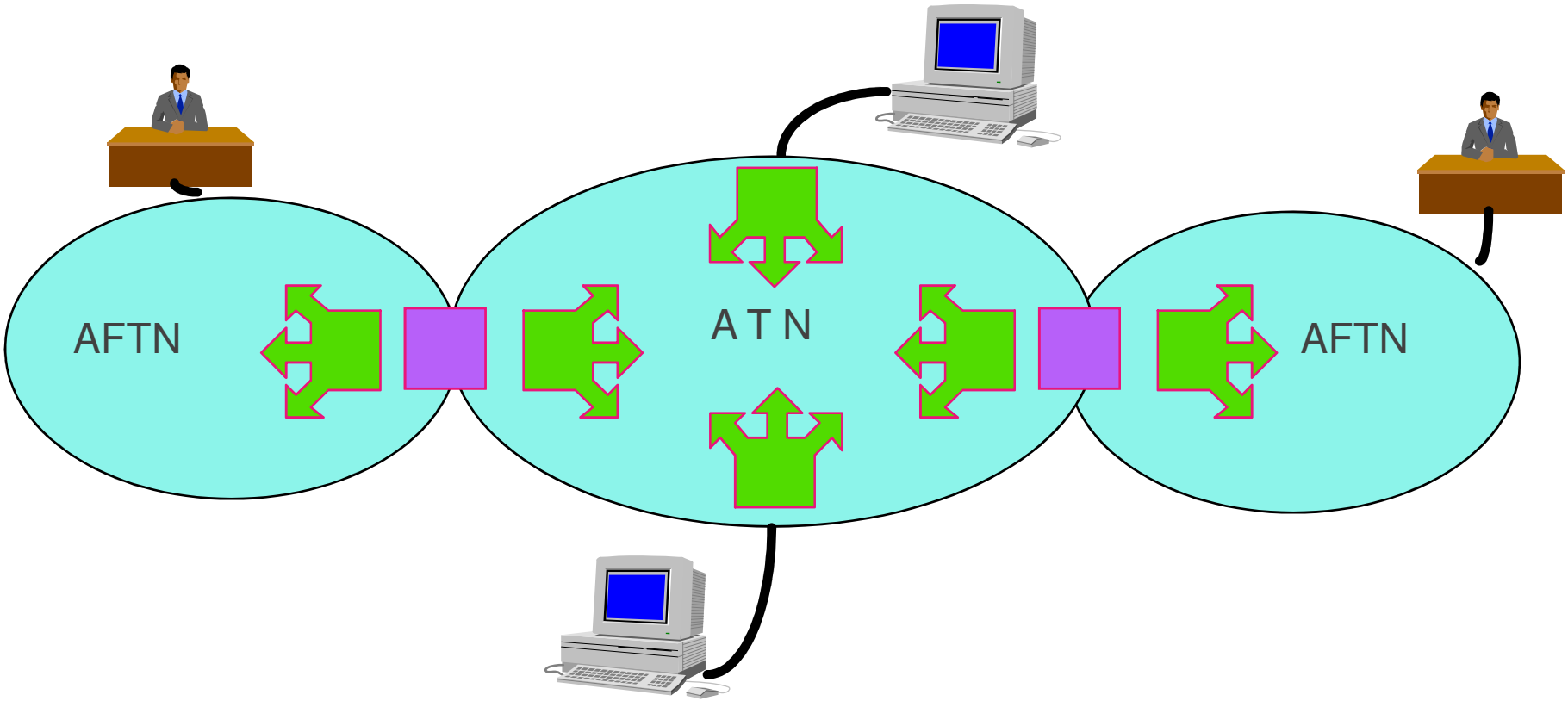
AMHS Operational requirements (2/4)



AMHS Operational requirements (3/4)



AMHS Operational requirements (4/4)



AMHS / ATS Message Service
MHS/X.400 Overview : The Standards (1/2)

- CCITT / ITU-T X.400 Series of Recommendation
  Message Handling Systems
- ISO/IEC 10021 (9 parts) : Both texts are aligned in principle.
- The ATS Message Service (AMHS) fully complies with the ISO standards which are mature and widely implemented.

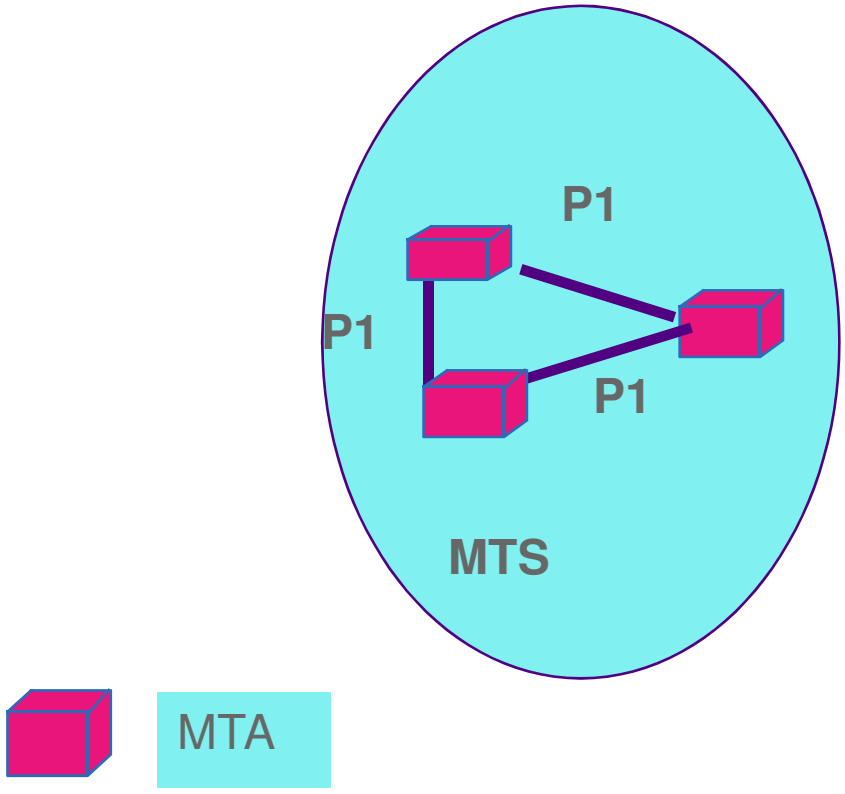
ATSMHS Users

- Direct AMHS users shall use either the basic ATSMHS or the extended ATSMHS at an ATS message user agent.
- Indirect AMHS users shall use only that part of the ATSMHS which corresponds to AFTN functionalities by using the interworking capability provided by an AFTN/AMHS gateway.
- X.400 includes some organisational restrictions
- ISO is the applicable AMHS standard

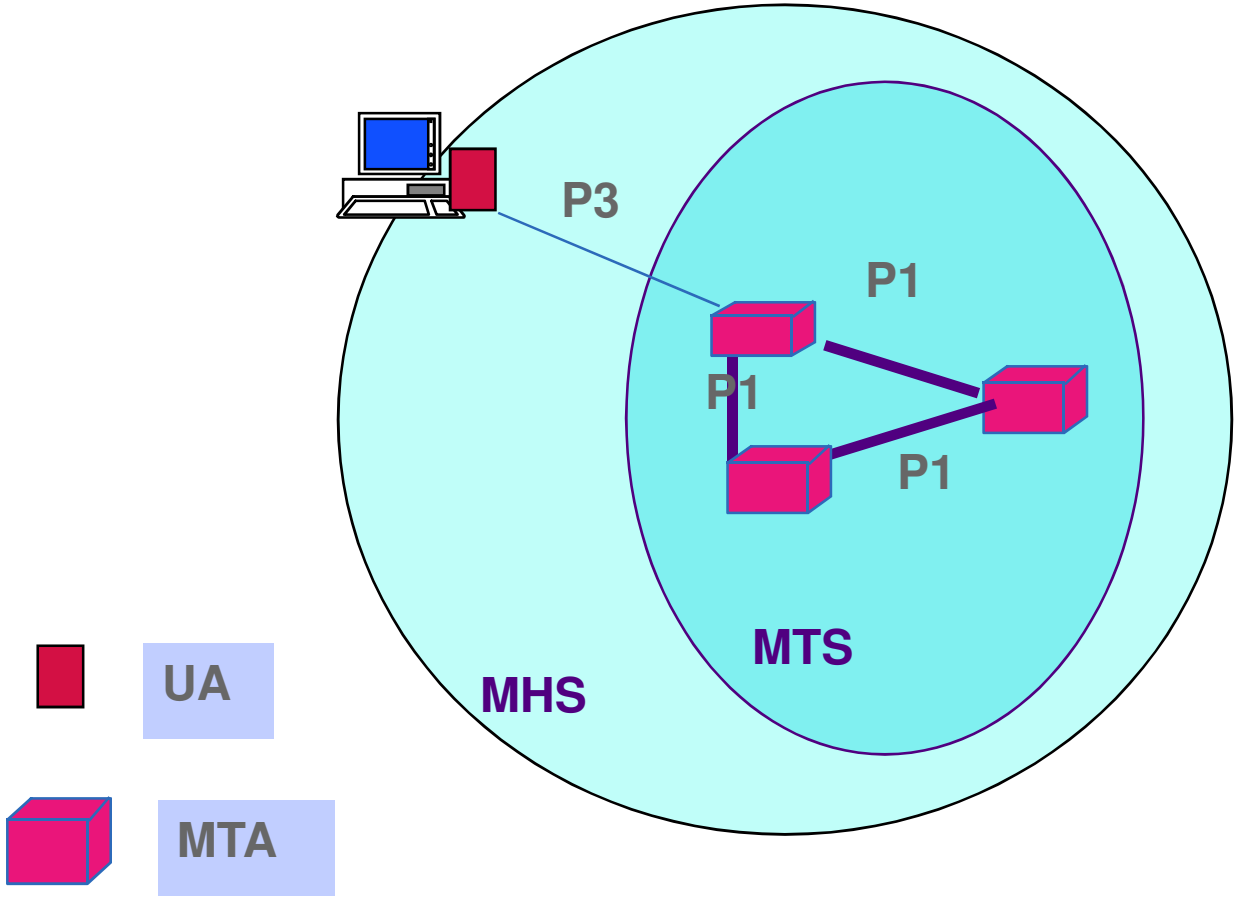
AMHS / ATS Message Service
X.400 Overview : functional components

- **MTA** = Message Transfer Agent
  - Message Switch
- **UA** = User Agent
  - User Access to the MTA
  - Human Machine Interface is not standardised
- **MS** = Message Store
  - Intermediary storage between MTA and UA
  - Usually co-located with MTA
- **AU** = Access Unit
  - Conversion to other Messaging Systems

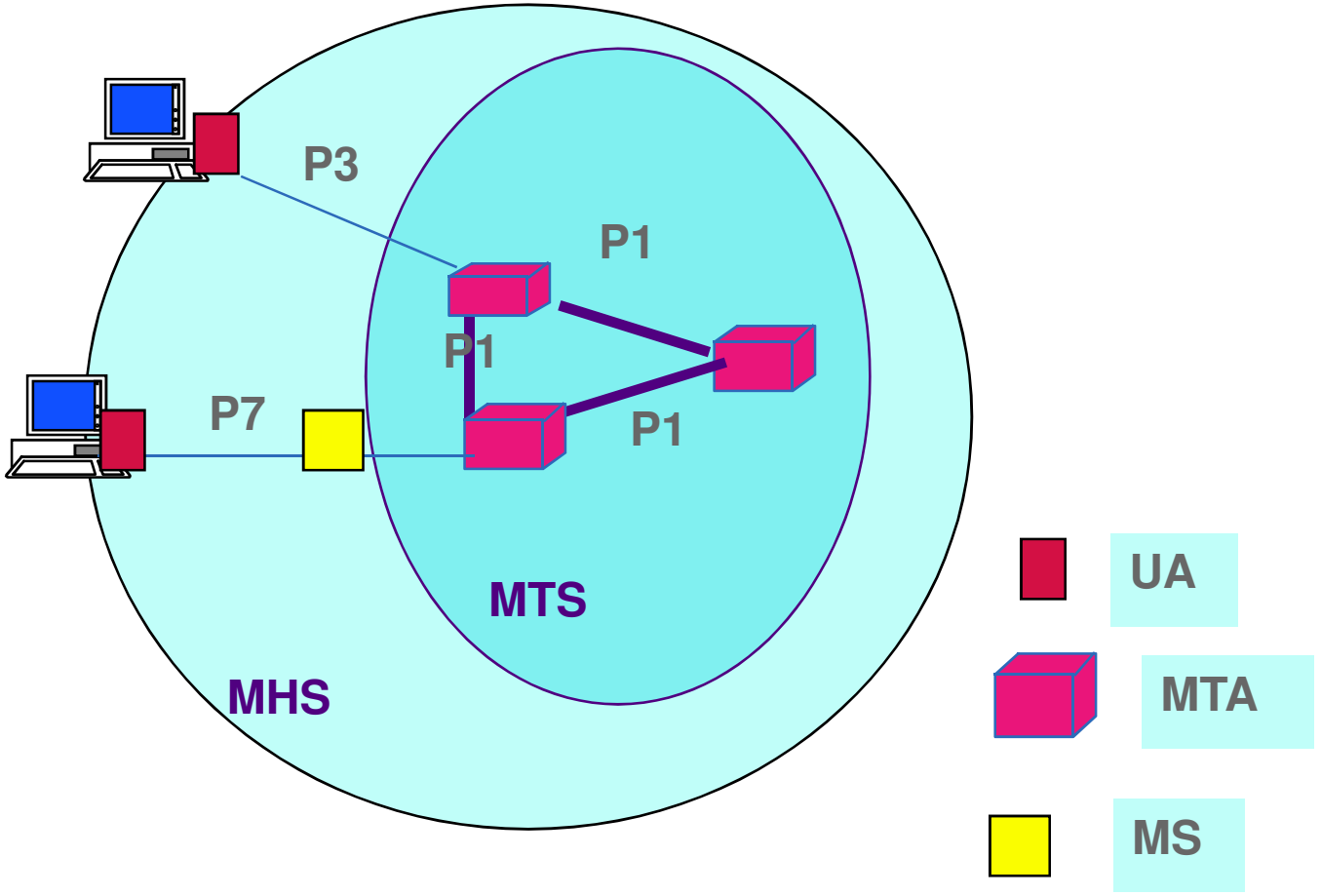
AMHS / ATS Message Service
X.400 Overview : Functional Components (MTA)



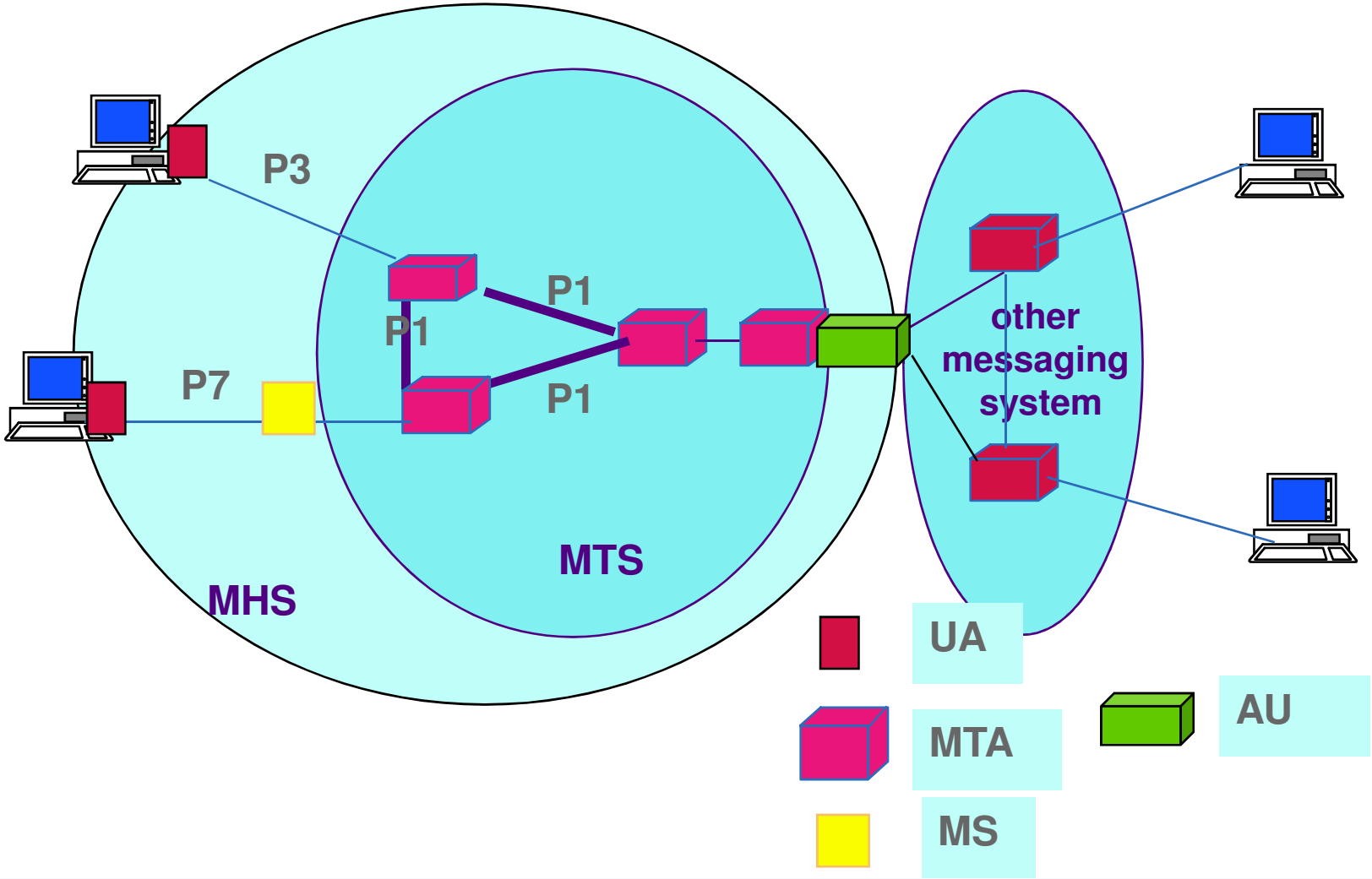
AMHS / ATS Message Service
X.400 Overview : Functional Components (UA)



AMHS / ATS Message Service
X.400 Overview : Functional Components (MS)

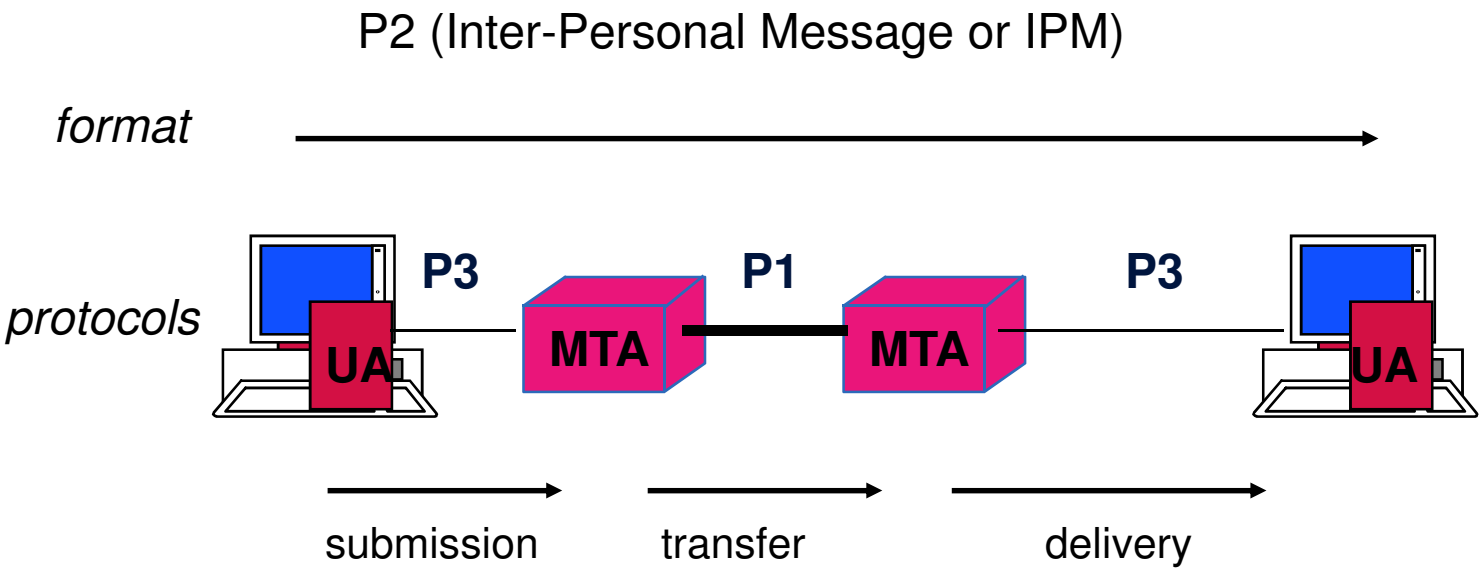


AMHS / ATS Message Service
X.400 Overview : Functional Components (AU)



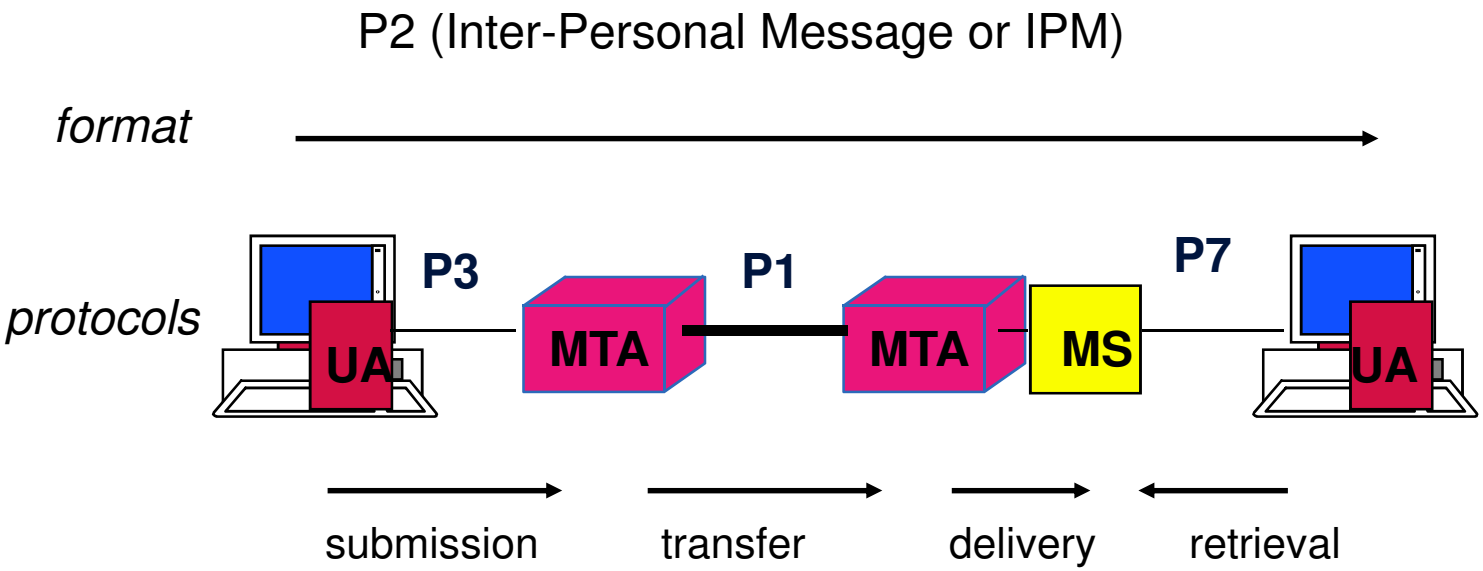
AMHS / ATS Message Service - X.400 Overview Protocols, Formats and Operations (1/2)

Operation without message store

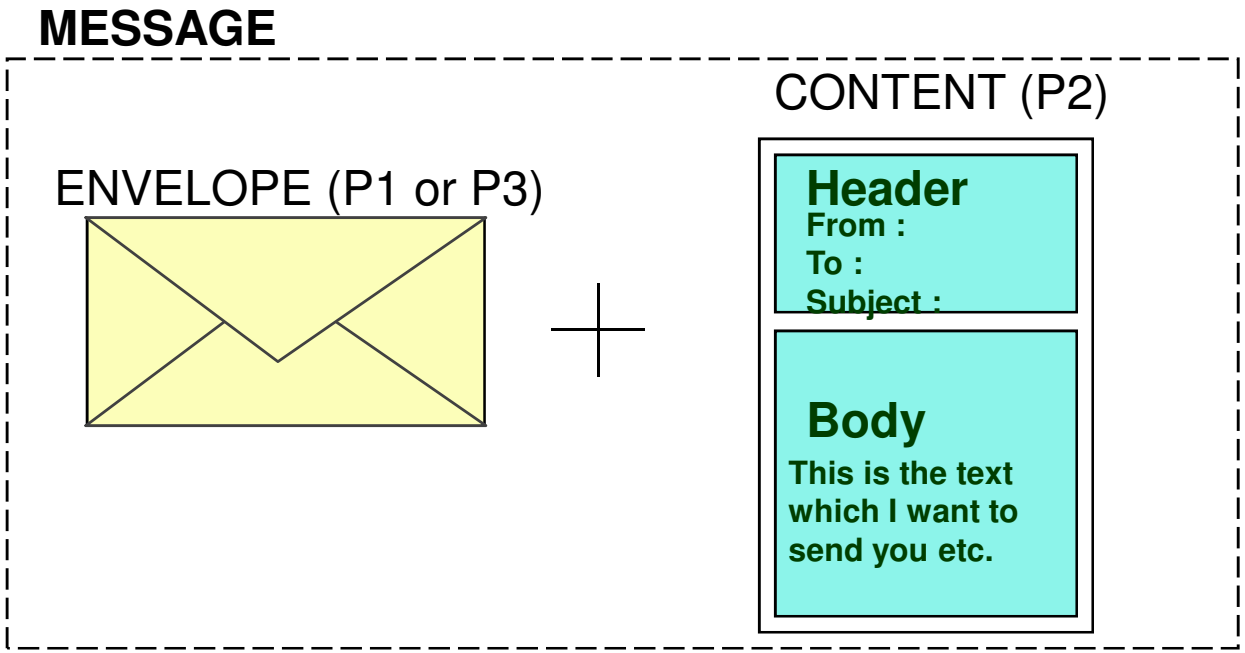


AMHS / ATS Message Service - X.400 Overview Protocols, Formats and Operations (2/2)

Operation with message store



AMHS / ATS Message Service
X.400 Overview : Messages



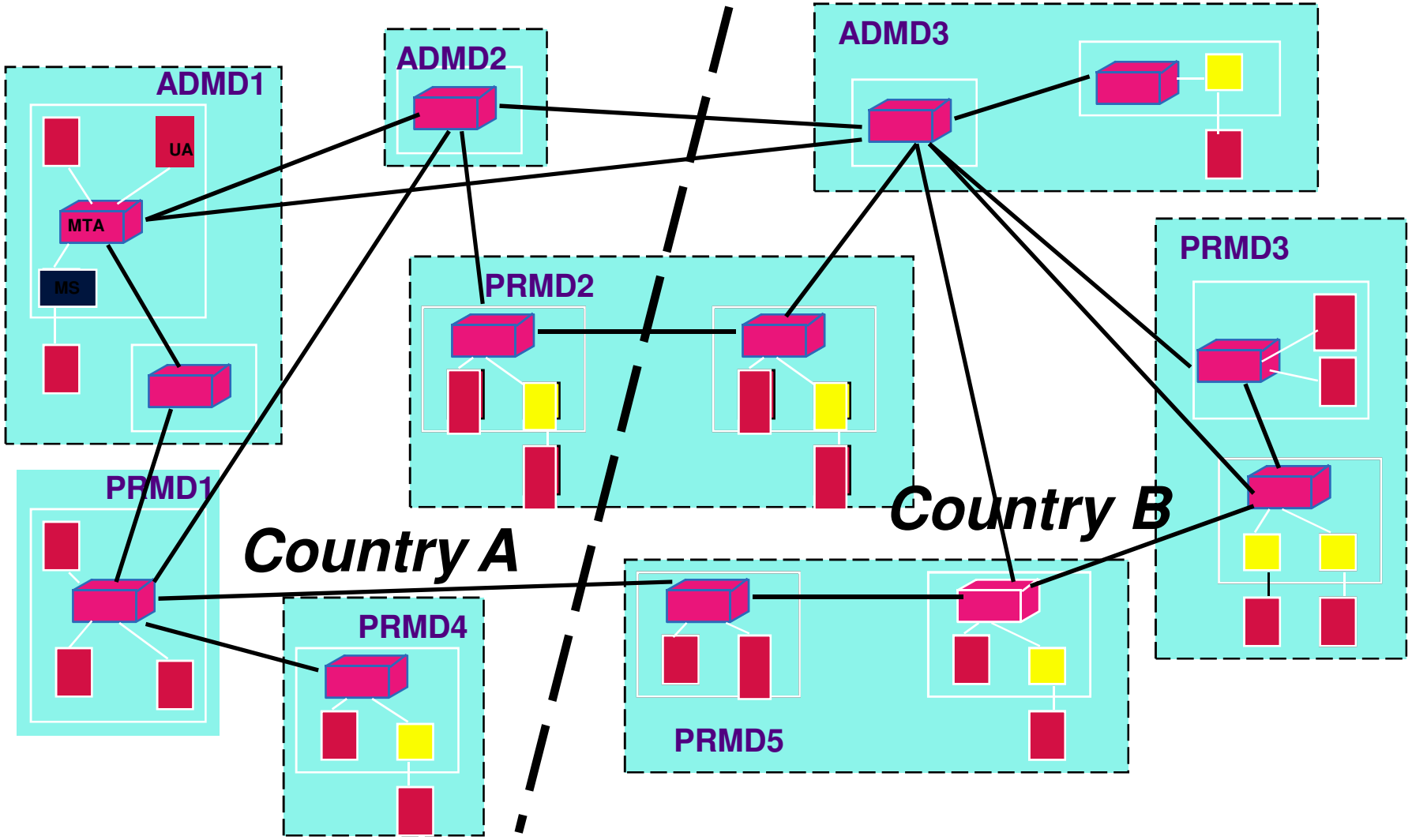
AMHS / ATS Message Service
X.400 Overview : Probes and Reports

- **Probe** = Message without Content (envelope only)
- **Report** = To inform the message originator about the outcome of a message conveyance:
  - Delivery Report (if delivery successful)
  - Non-Delivery Report (if transfer or delivery failed)

AMHS / ATS Message Service
X.400 Overview : Management Domains

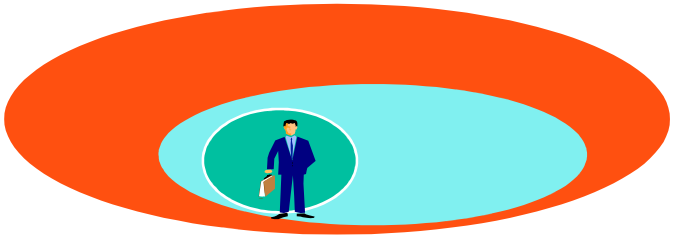
- Management Domain :
  an organisational entity which manages at least one MTA (or several), and is responsible for the users connected to its MTA(s)
- a Management Domain can be :
  - ADMD (Administrative Management Domain), generally operated by a public telecom operator.
  - PRMD (Private Management Domain), generally operated by a private company or organisation.
- Usually an ADMD provides services to the public or a a community, while a PRMD serves only its own organisation.
- In accordance with ITU-T, ICAO is now the name an ADMD

AMHS / ATS Message Service - X.400 Overview
Examples of MD Interconnections



AMHS / ATS Message Service
X.400 Overview : Addressing

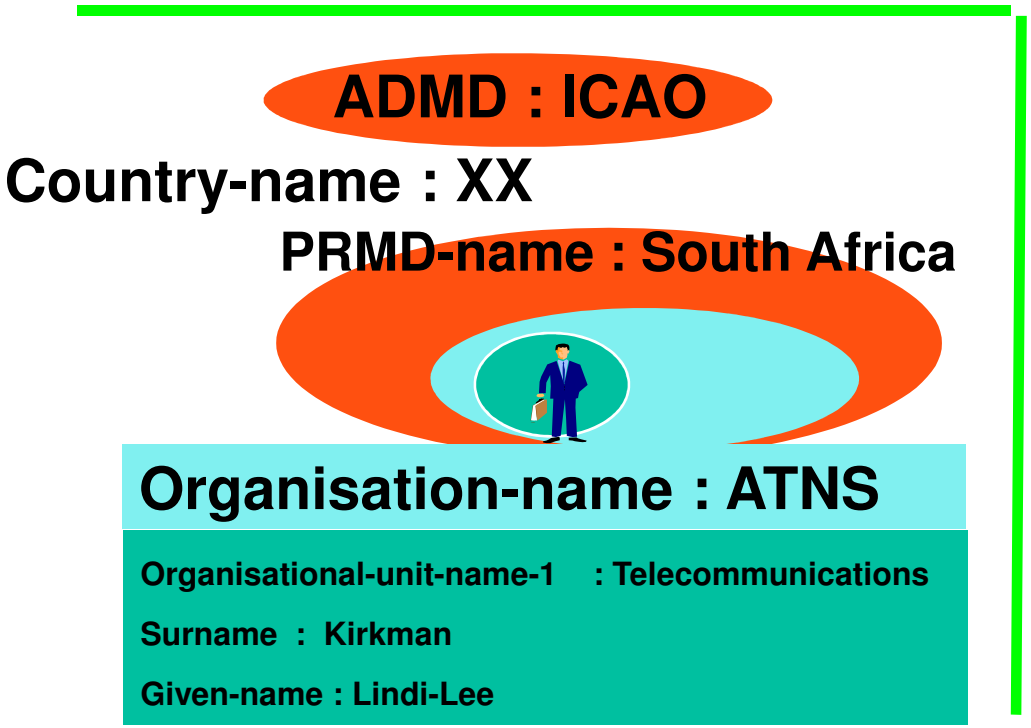
Each user (UA) in a Management Domain is identified with an **O/R Address** consisting of a set of **attributes**



- Four forms of O/R Addresses exist:
  - mnemonic (mostly used)
  - numeric
  - postal
  - terminal
- The available standard attributes for mnemonic O/R addresses are :
  - organisation-name (O)
  - organisational-units-name (4 values) (OU1 to OU4)
  - personal-name (surname, given-name, initial) (S, G, I)
  - common-name (CN)

AMHS / ATS Message Service
X.400 Overview : Addressing

C=XX / A=ICAO / P=KENYA / O=ATNS / OU1 =COM Division / S=Kirkman / G=Lindi-Lee



- The Management Domain is globally identified by 2 or 3 standard attributes:
  - Country-name (C)
  - ADMD-name (A)
  - PRMD-name (P)

AMHS / ATS Message Service
AFTN / X.400 : functional equivalence

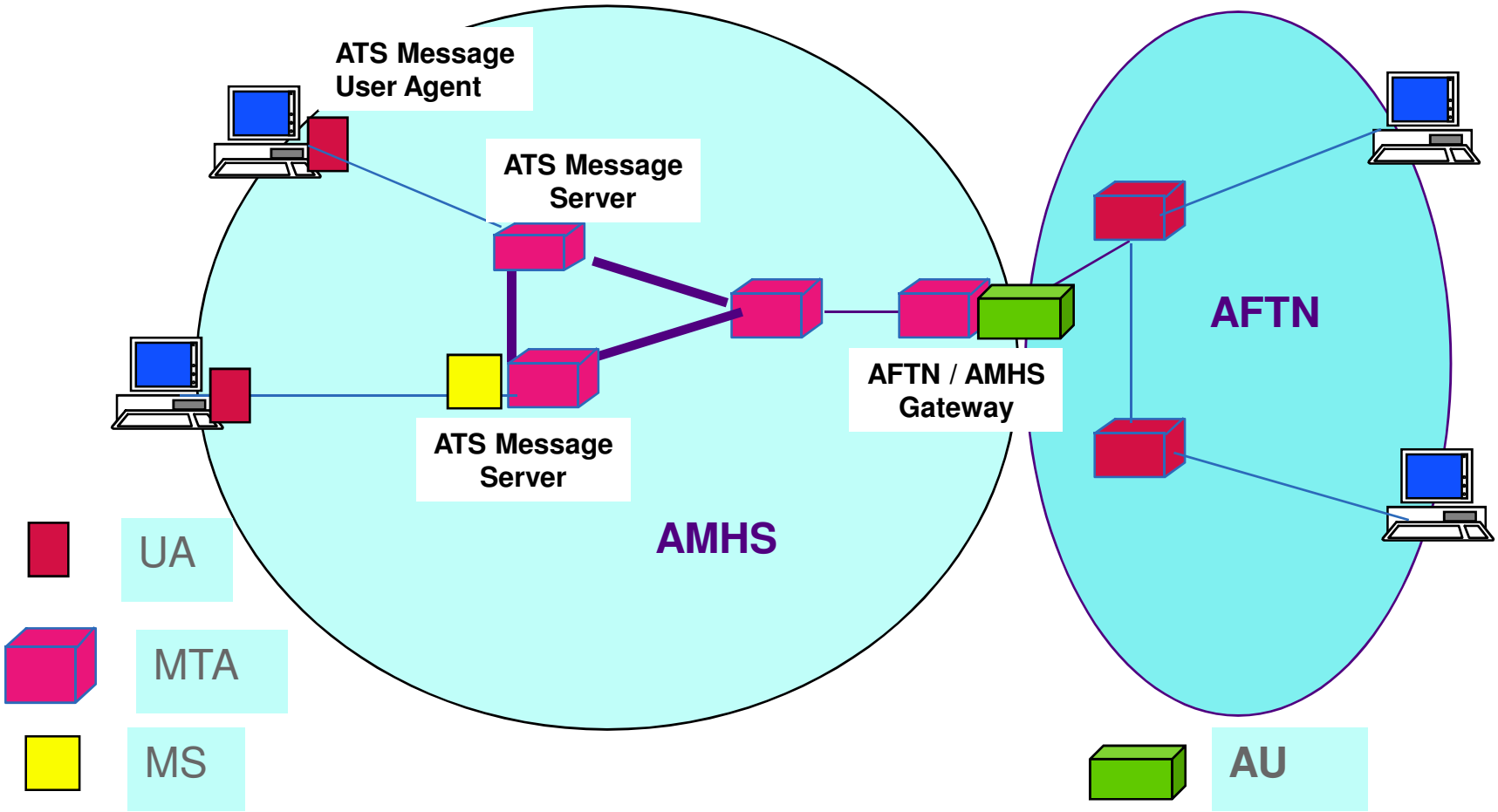
AFTN	X400
AFTN Centre	MTA
AFTN Station	UA
Addressee Indicator	O/R Address

AMHS / ATS Message Service
Support of the ATS Message Service

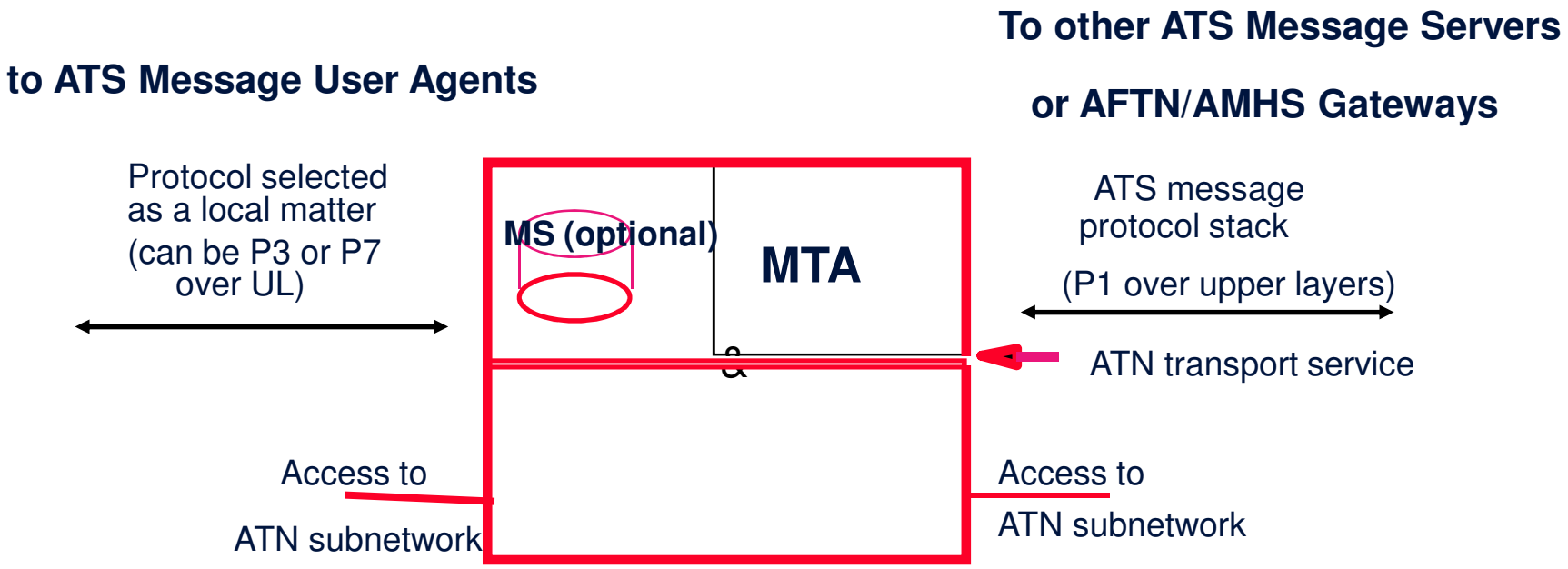
- The provider of the ATS Message Service is called **ATS Message Handling System (AMHS)**

AFTN	MHS/X.400	AMHS
AFTN Centre	MTA	ATS Message Server (also includes optional MS)
AFTN Station	UA	ATS Message User Agent
	AU (+MTA)	AFTN / AMHS Gateway

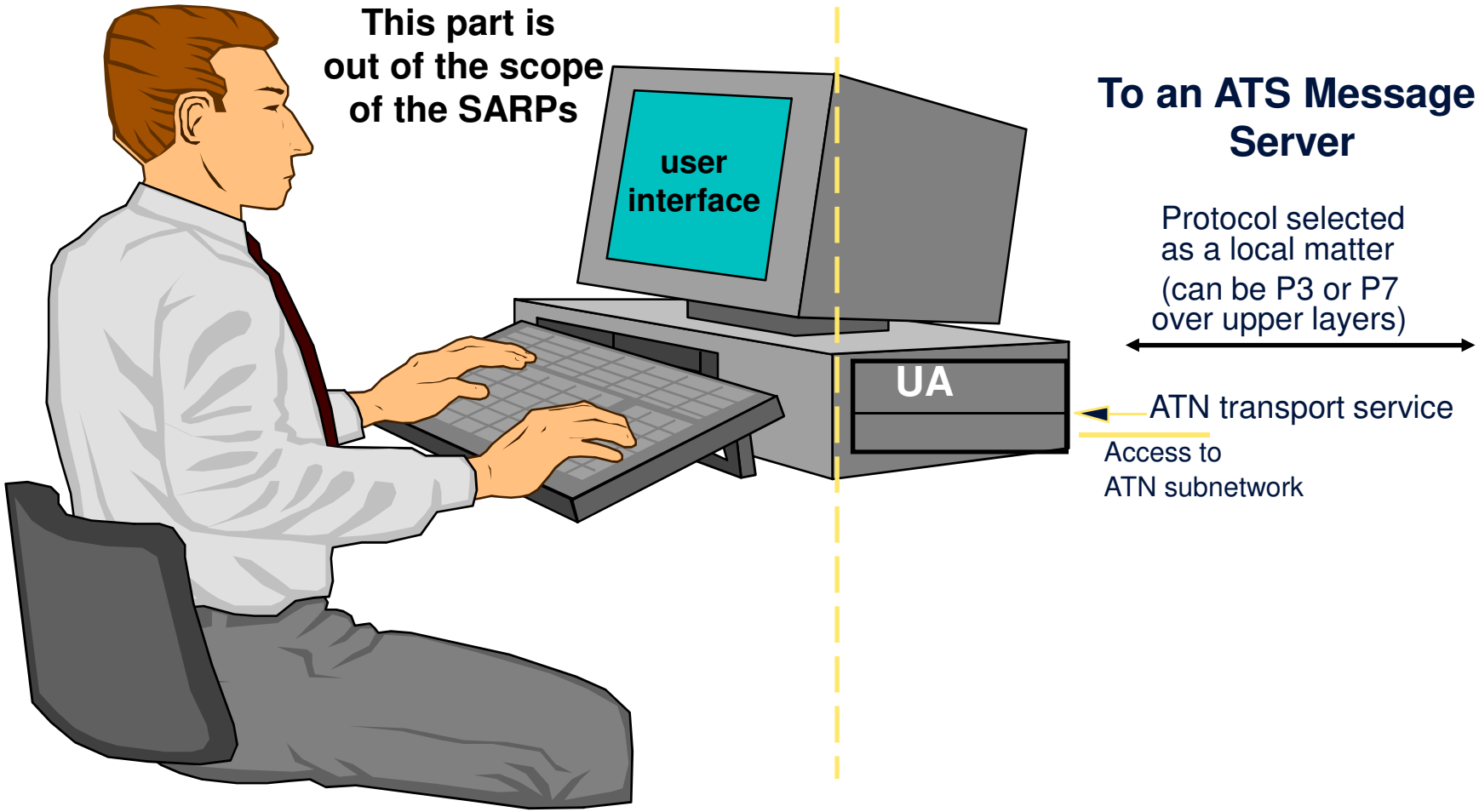
AMHS / ATS Message Service
ATS Message Handling System (AMHS)



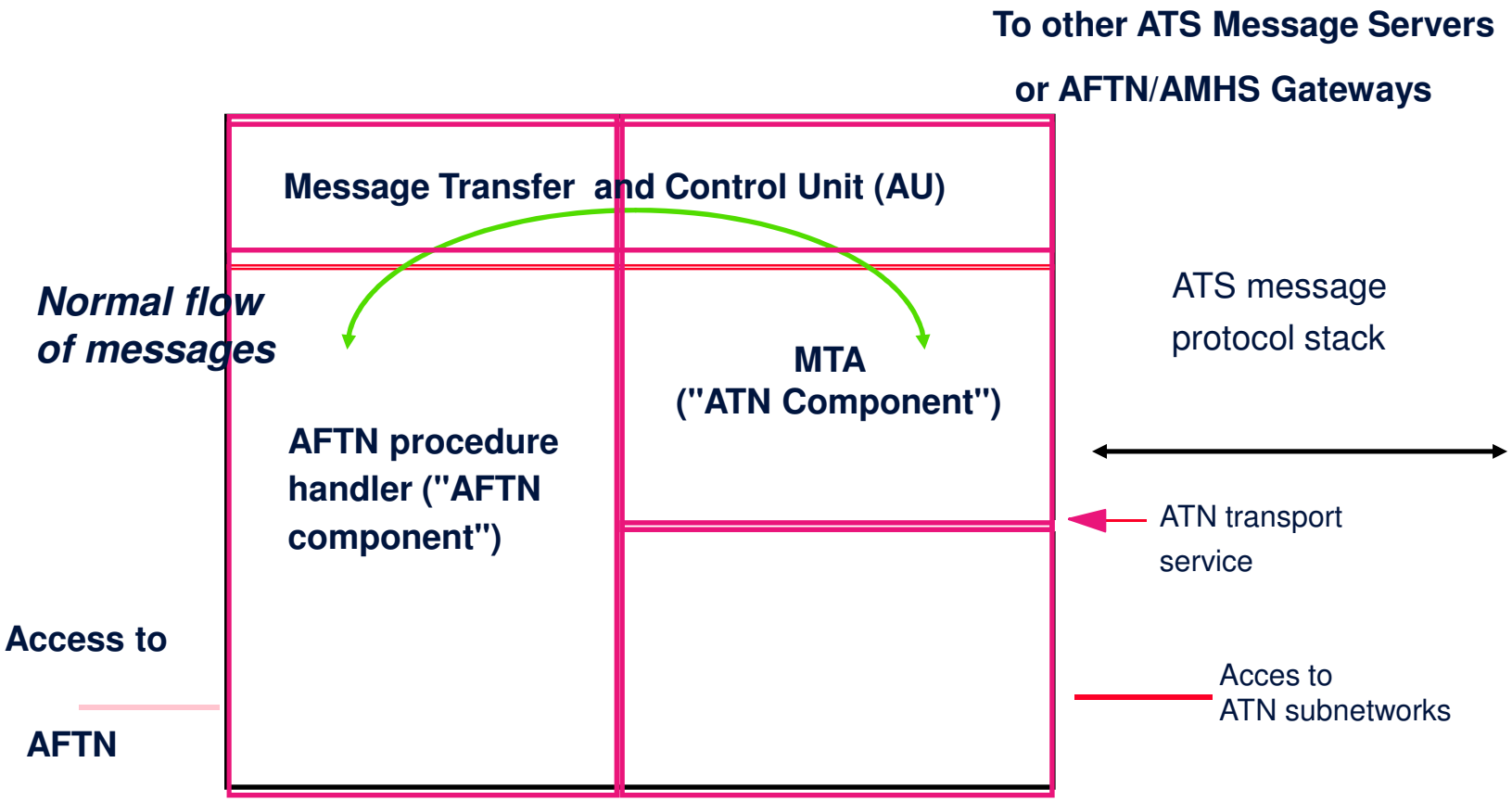
AMHS / ATS Message Service
ATS Message Server



AMHS / ATS Message Service
ATS Message User Agent



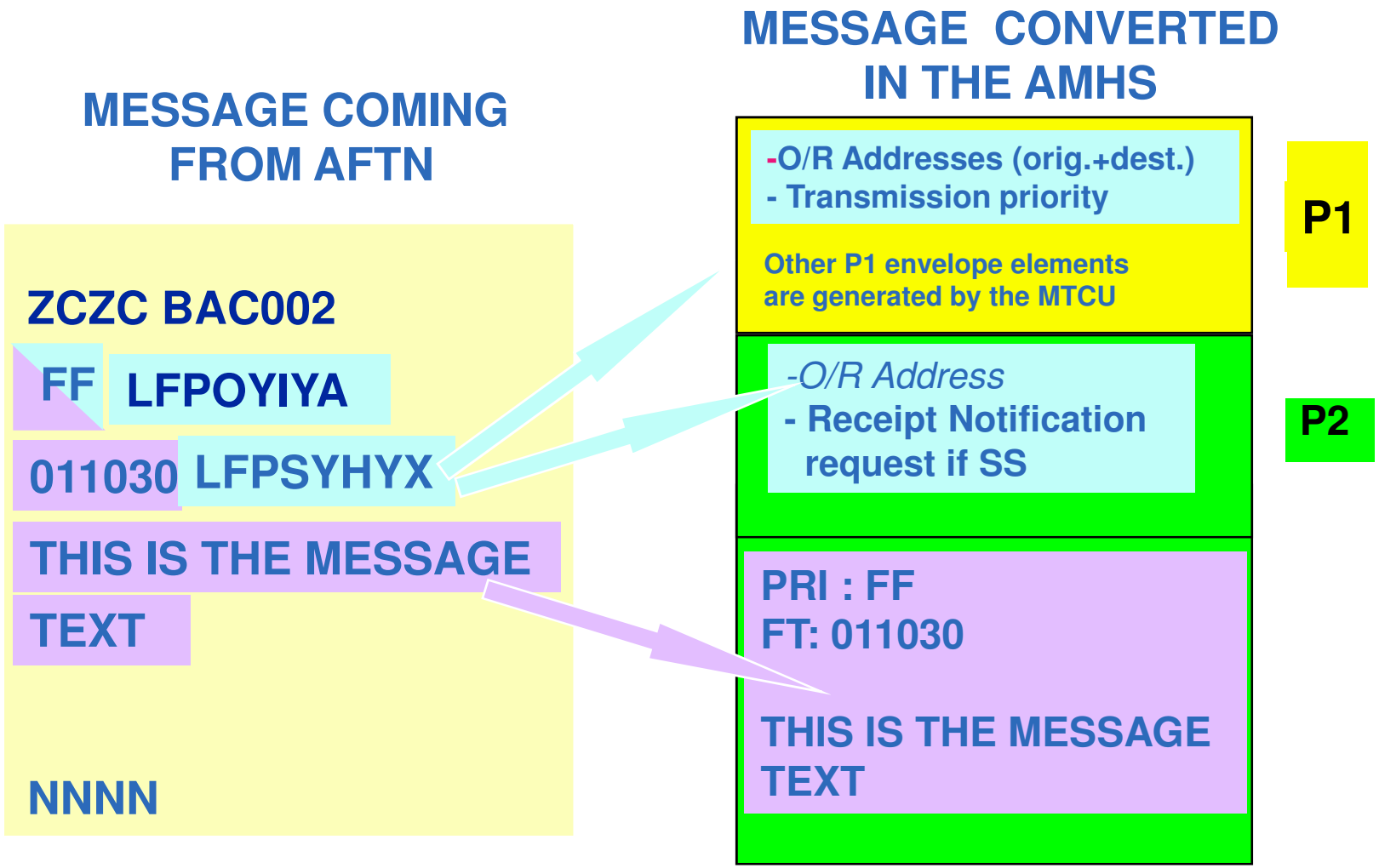
AMHS / ATS Message Service
AFTN/AMHS Gateway (General Design)



AMHS / ATS Message Service
AFTN/AMHS Gateway (General Functionalities)

- Management of AFTN procedure
- AFTN ITA-2 to/from IA-5 conversion if needed traffic logging
- Conversion of AFTN messages (and of certain service messages) to/from AMHS messages and reports
- Rejection of AMHS messages which cannot be conveyed over the AFTN
- Address mapping : conversion of AFTN addressee indicators to/from O/R addresses
- Full MHS/X.400 support by ATN Component

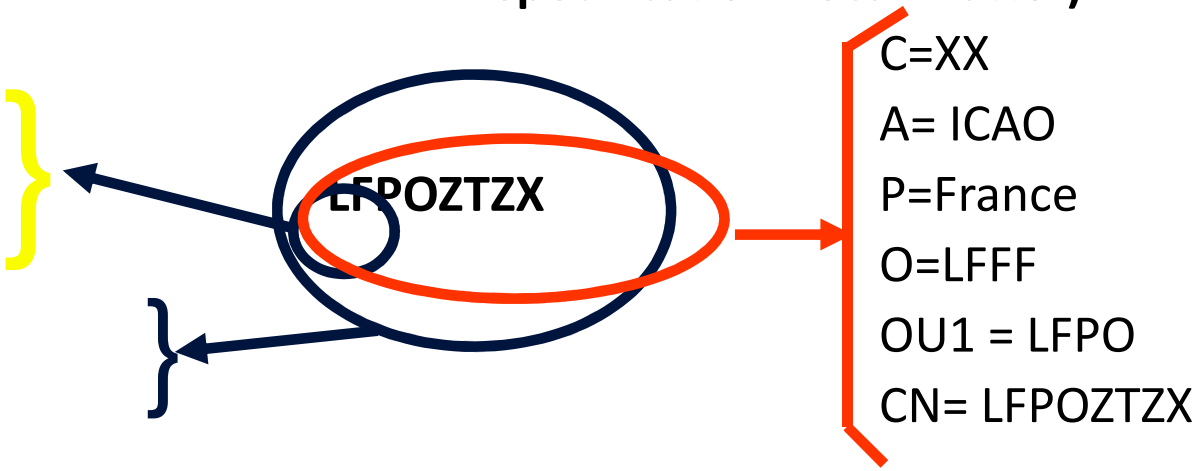
AMHS / ATS Message Service
AFTN/AMHS Gateway (Conversion of Messages)



AMHS - AFTN/AMHS Gateway (Address Mapping)

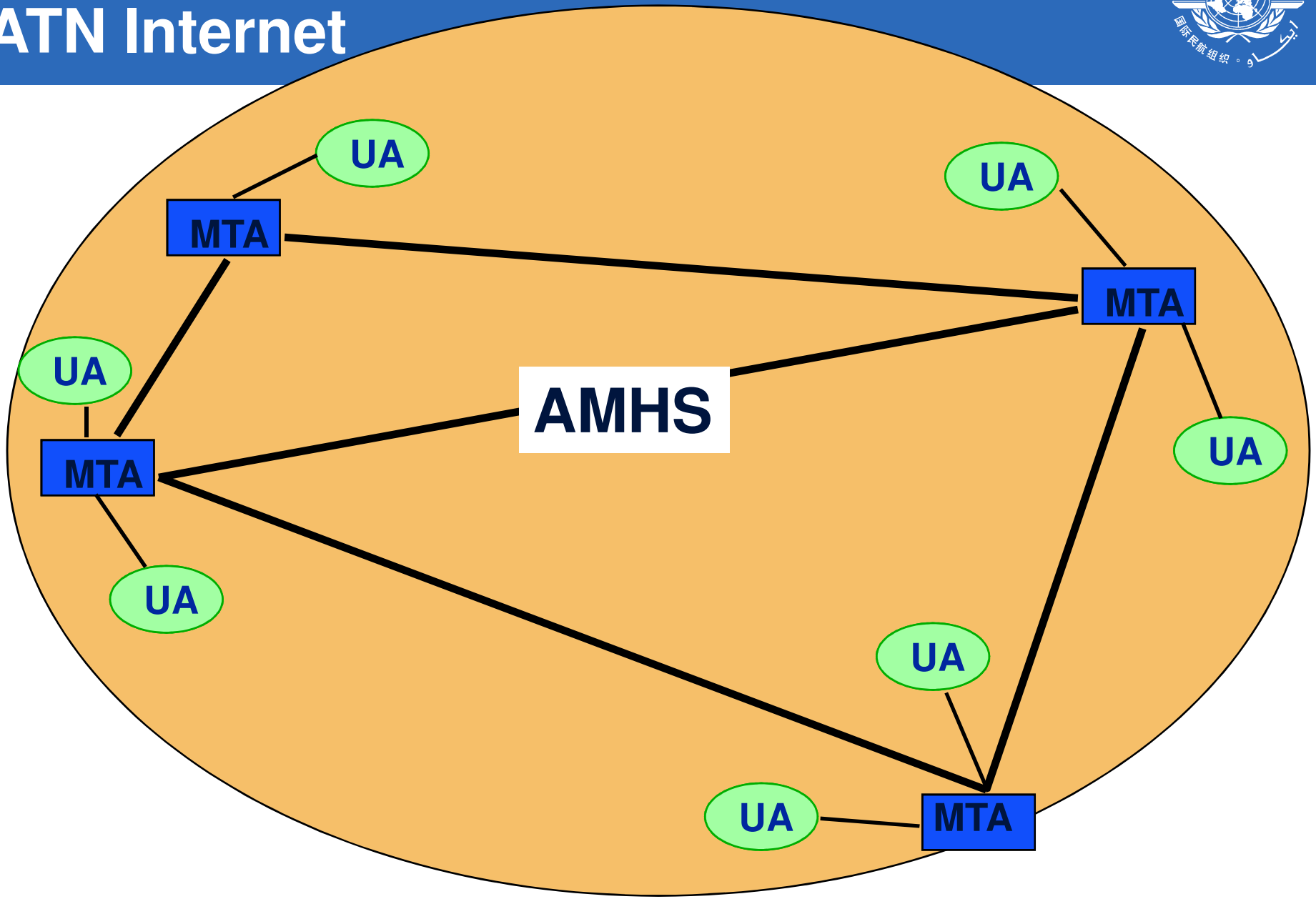
- **Use of XF-Addresses (defined in the SARPs)**
  - C=XX
  - A=ICAO
  - P=France
  - O=AFTN
  - OU1=LFPOZTZX

Use of MF-Addresses (without further SARPs specification: local matter)



- → **Two types of addressing plans (common or local)**
- → **Two ways of mapping addresses**

ATS Message Service - Position of AMHS vs ATN Internet



Conclusion on AMHS (1/2)

- A store-and-forward messaging system over the ATN Internet or over existing industrial solutions
- The system fully complies with mature standards
- Widely available using off-the-shelf products
- Full interoperability with AFTN via the AFTN/AMHS Gateway

Conclusion on AMHS (2/2)

- **Significant improvements with the Basic ATS Message Service:**
  - **no limit on message length**
  - **no limit on number of recipients per message**
  - **non-delivery reports**
  - **subject indication**
  - **very large extension capability (redirection, security) with functional groups (FGs) =>*Extended ATS Message Service***

Questions?

Thank you