



## AMHS Interfaces

COMSOFT GmbH

### **SP/5 - AMHS Interface Options for Third-party, Non-AMHS Systems**

SP/5

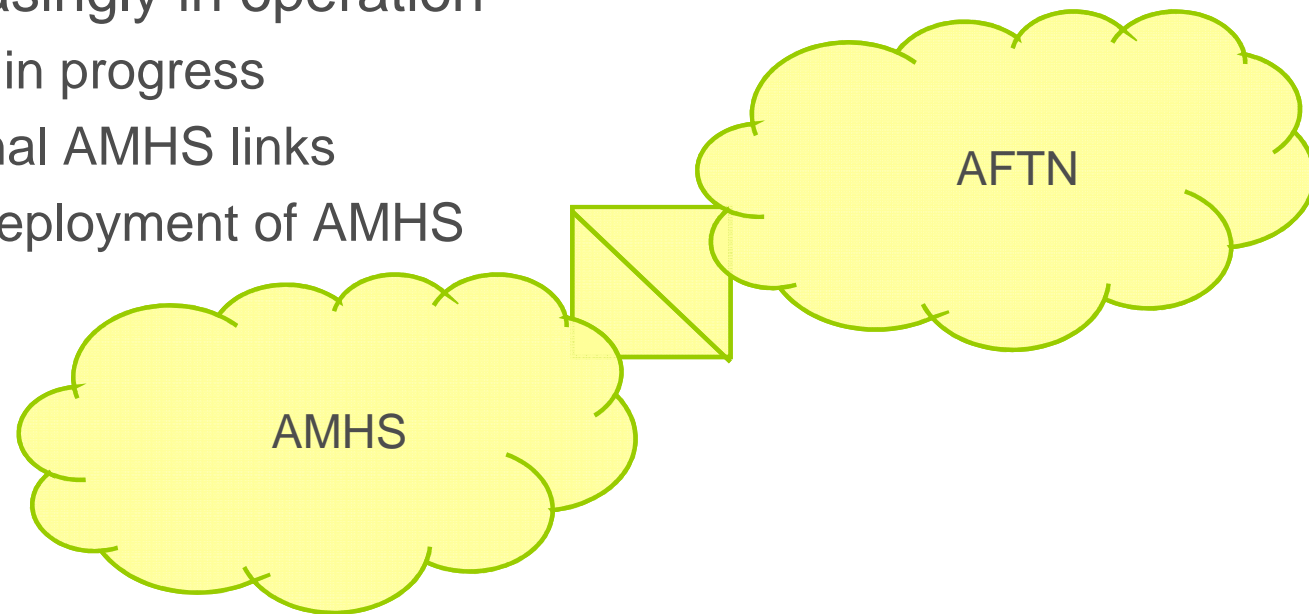
**AMHS/SWIM Workshop and the  
7<sup>th</sup> Meeting of the Aeronautical Telecommunication Network  
(ATN) Implementation Co-ordination Group of APANPIRG  
(ATNICG/7)**

**Chiang Mai, Thailand, 5 – 9 March 2012**

**COMSOFT**  
is making the link

## Interface to the AMHS needed ?

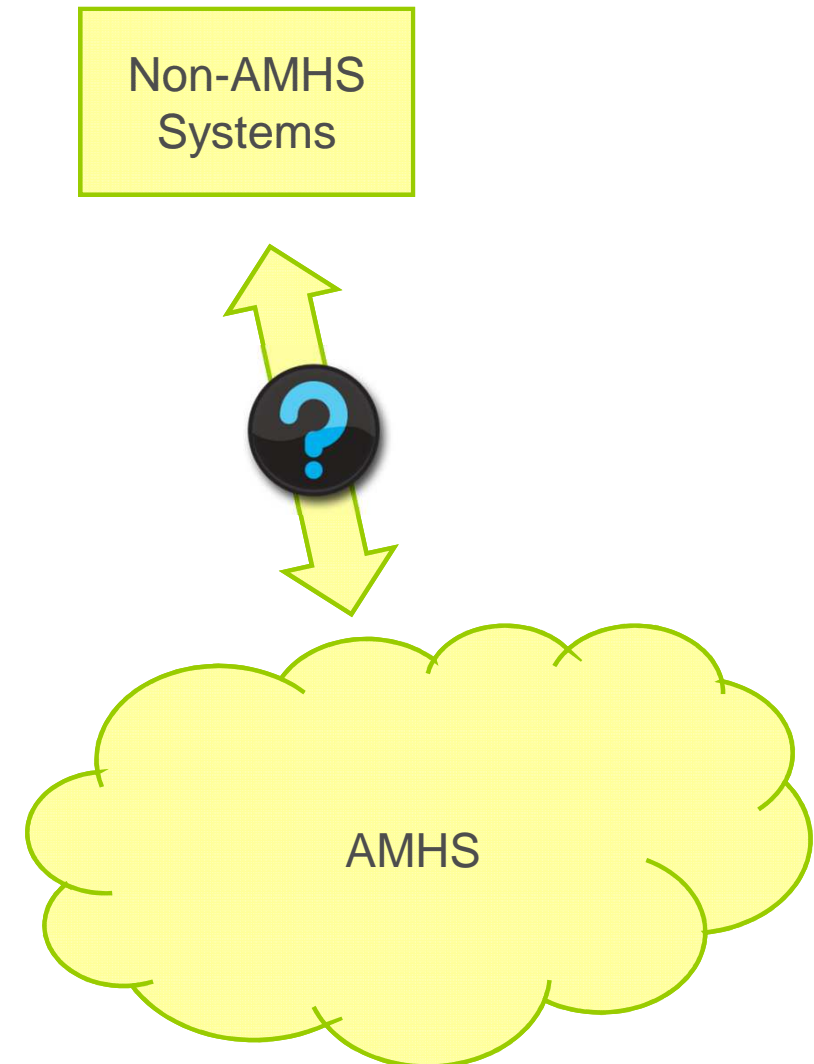
- AMHS increasingly in operation
  - Transition in progress
  - International AMHS links
  - National deployment of AMHS



- Self-contained system
- Exchange of information between
  - Direct users: AMHS – AMHS
  - Indirect users: AMHS – AFTN (Gateway)

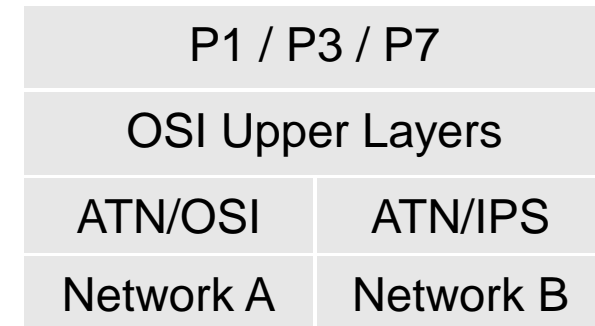
# Potential Clients of the AMHS

- Non-AMHS, third-party, automation systems
  - FPL processing systems
  - MET switches
  - Digital NOTAM offices
  - New ATM applications
  - ...
- How to interface the AMHS
  - Loose coupling
  - Provide information to AMHS users
  - Connect two, non-AMHS entities over the AMHS

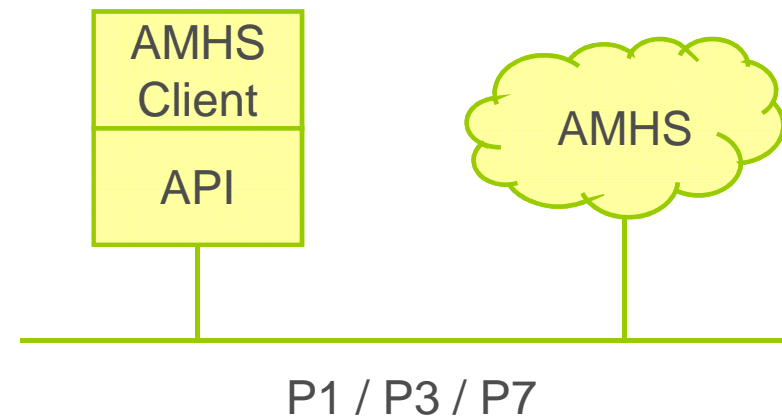


# Standard Interfaces

- Characteristics
  - Standardised protocols for AMHS
  - Rich set of functions
  - Built-in P1, P3 or P7 on server side
  - APIs available from X.400/AMHS vendors



- Prerequisites
  - API for AMHS client
  - Network connection



## Drawbacks of Standard Interfaces

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- Requires full implementation of ATS Message User Agent (UA) function
  - Full seven layers OSI stack
  - Complexity (effort for development, testing & integration)
  - Availability of Application Programming Interface (X.400/AMHS API)
  
- Is full set of AMHS functions really needed ?
  - Functions: Send and receive
  - Information objects: messages incl. notifications, reports & probes
  - Attributes: Numerous mandatory attributes
  
- Know how required
  - Skilled X.400/AMHS developers
  - Trained system operators



## Specific Demand of AMHS Clients



- System user (automation system)
  - Automated exchange of information



- AMHS is one interface among several



- Effort for integration

- Time
- Costs



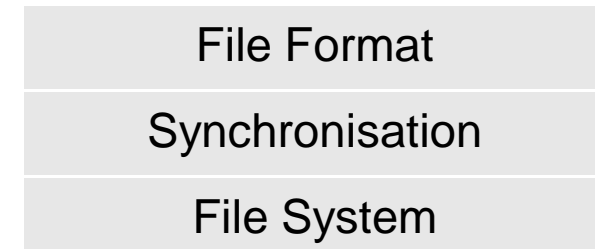
- Limited and special requirements

- Reduced set of AMHS features required
- Default or fixed values
- Simplified access to the AMHS

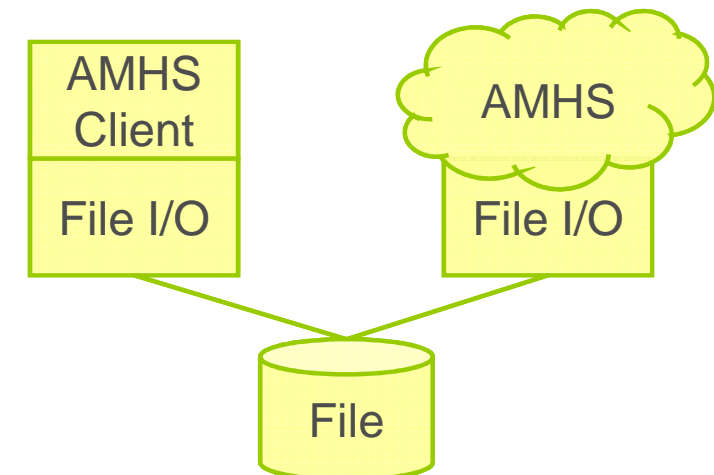


# File Interface

- Characteristics
  - Classic approach
  - Simple, but error-prone
  - Highly proprietary

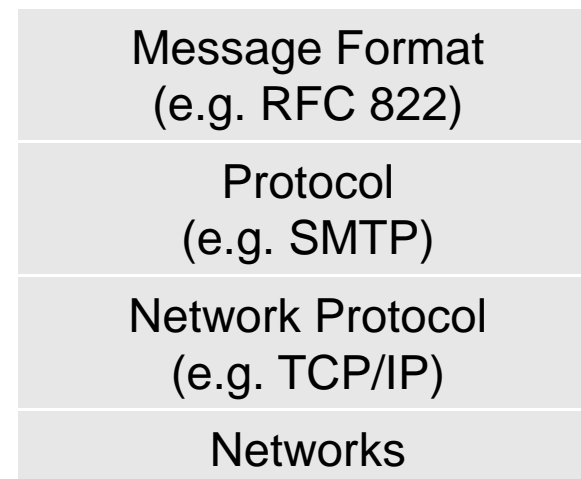


- Prerequisites
  - Specification of file format
  - Synchronisation mechanism
  - Co-location of AMHS client (common file system)
  - AMHS enhancement



# Interface AMHS through Gateway

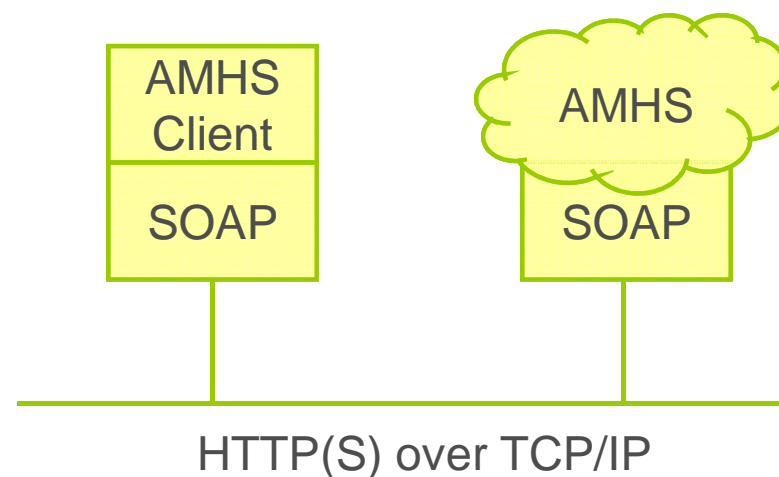
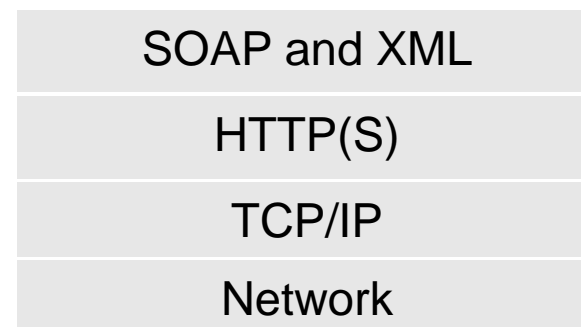
- Characteristics
  - Re-use of existing components
  - Complex overall solution
- Examples:
  - AFTN/AMHS Gateway
  - Email/AMHS Gateway
- Prerequisites
  - Gateway
  - Library for AMHS client
  - Network connection





# SOAP Interface

- Characteristics
  - Up-to-date Web technology
    - Used in new ATM applications
  - Full framework
  - High level of interoperability
  - Flexible and extensible
  - Loose coupling
- Prerequisites
  - Format specification (XML)
  - SOAP library
  - AMHS enhancement



## SOAP: Major Advantages

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- Implementation independence by loose coupling
- Broad adoption: Availability of know how, libraries and tools
- Efficiency in implementation
  - Faster to develop and modify
  - Lower costs
- XML allows for machine- and human-reading
- COMSOFT Products with SOAP AMHS interface:
  - CADAS-ATS: ATS Message User Agents
  - AIDA-NG: ATS Message Server (available soon)



# SOAP: Example

- AMHS File Transfer Body Part in XML notation:



```

<BodyPart>
  <parameters>
    <type-id>
      2.6.1.11.12
    </type-id>
    <value>
      <FileTransferParameters>
        <contents-type>
          <document-type>
            <document-type-name>
              1.0.8571.5.3
            </document-type-name>
          </document-type>
        </contents-type>
        <environment>
          <application-reference>
            <registered-identifier>
              2.16.840.1.113694.2.2.1.1
            </registered-identifier>
          </application-reference>
        </environment>
      </FileTransferParameters>
    </value>
  </parameters>
  <file-attributes>
    <pathname>
      <incomplete-pathname>
        <GraphicString>
          dnotam.xml
        </GraphicString>
      </incomplete-pathname>
    </pathname>
    <date-and-time-of-last-modification>
      <actual-values>
        20110330124444+0200
      </actual-values>
    </date-and-time-of-last-modification>
  </file-attributes>
  <data>
    <type-id>
      2.6.1.4.12
    </type-id>
    <value>
      <FileTransferData>
        <SEQUENCE>
          <direct-reference>
            1.0.8571.5.3
          </direct-reference>
          <encoding>
            <octet-aligned>
              ( Payload )
            </octet-aligned>
          </encoding>
        </SEQUENCE>
      </FileTransferData>
    </value>
  </data>
</BodyPart>

```

# Summary

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- Several approaches for AMHS interfaces of non-AMHS systems
- Standard interfaces (P3/P7) often too complex and expensive
- Alternative options
- Promising: SOAP
  - Up-to-date technology
  - Easy to integrate in non-AMHS products
  - Flexible and extensible
  - Add-on to ATS Message User Agent or ATS Message Server

# Comments and Questions

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# Thank You!