AMHS ICD (and Implementation Issues)

ATN Seminar

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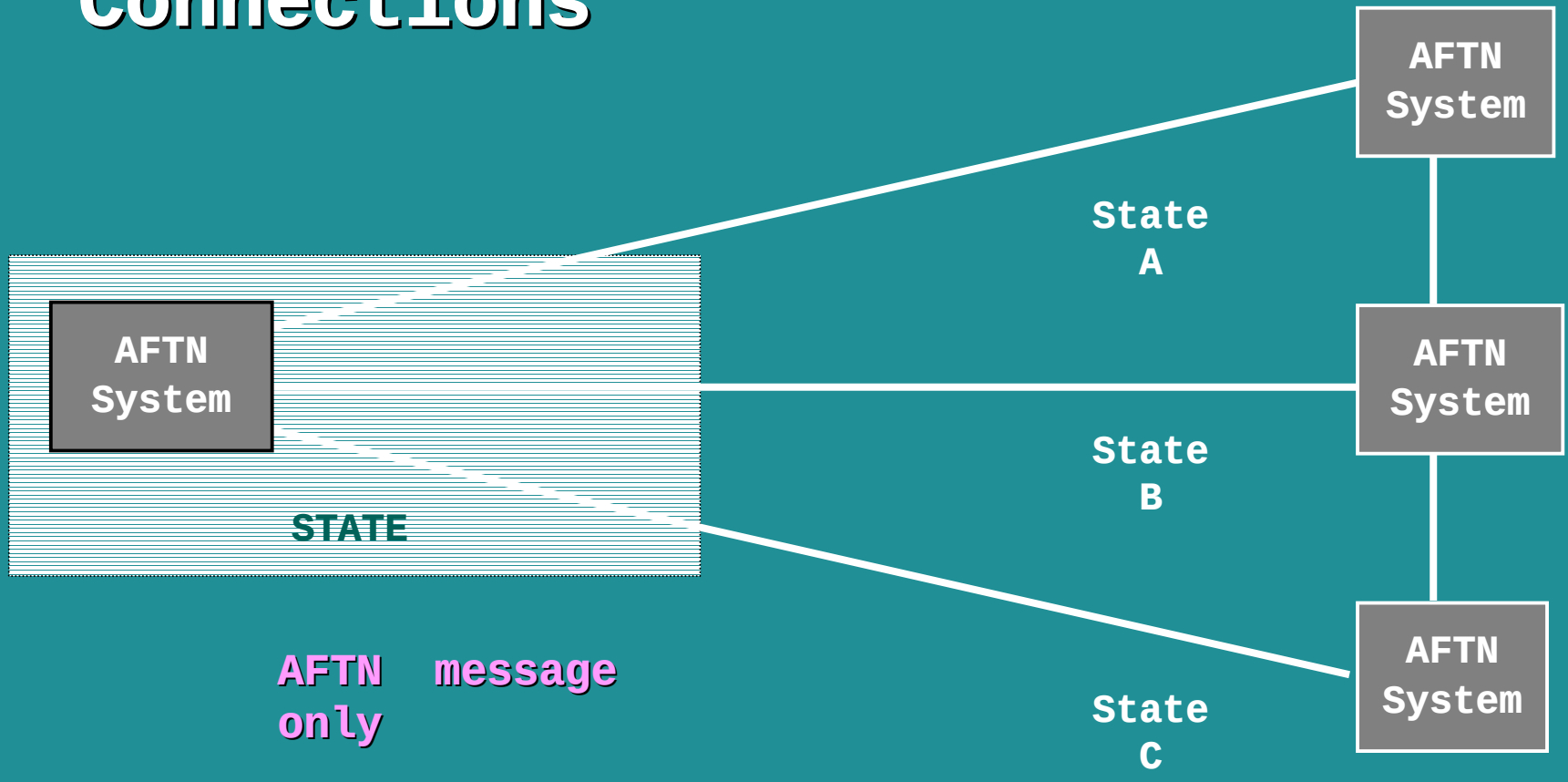
- Domestic AMHS Transition
- Special Features of AMHS/ AMHS ICD
- Some Considerations
- Conclusions

Regional AMHS Transition (1/11)

- Regional Transition from AFTN to AMHS
  - Phase-1: Current AFTN Connections
  - Phase-2: Gateway & ATN Router
  - Phase-3: ATS Message Server
  - Phase-4: Full AMHS International Connections
  - Phase-5: Full AMHS Connections
  - Phase-6: Full ATN Connections

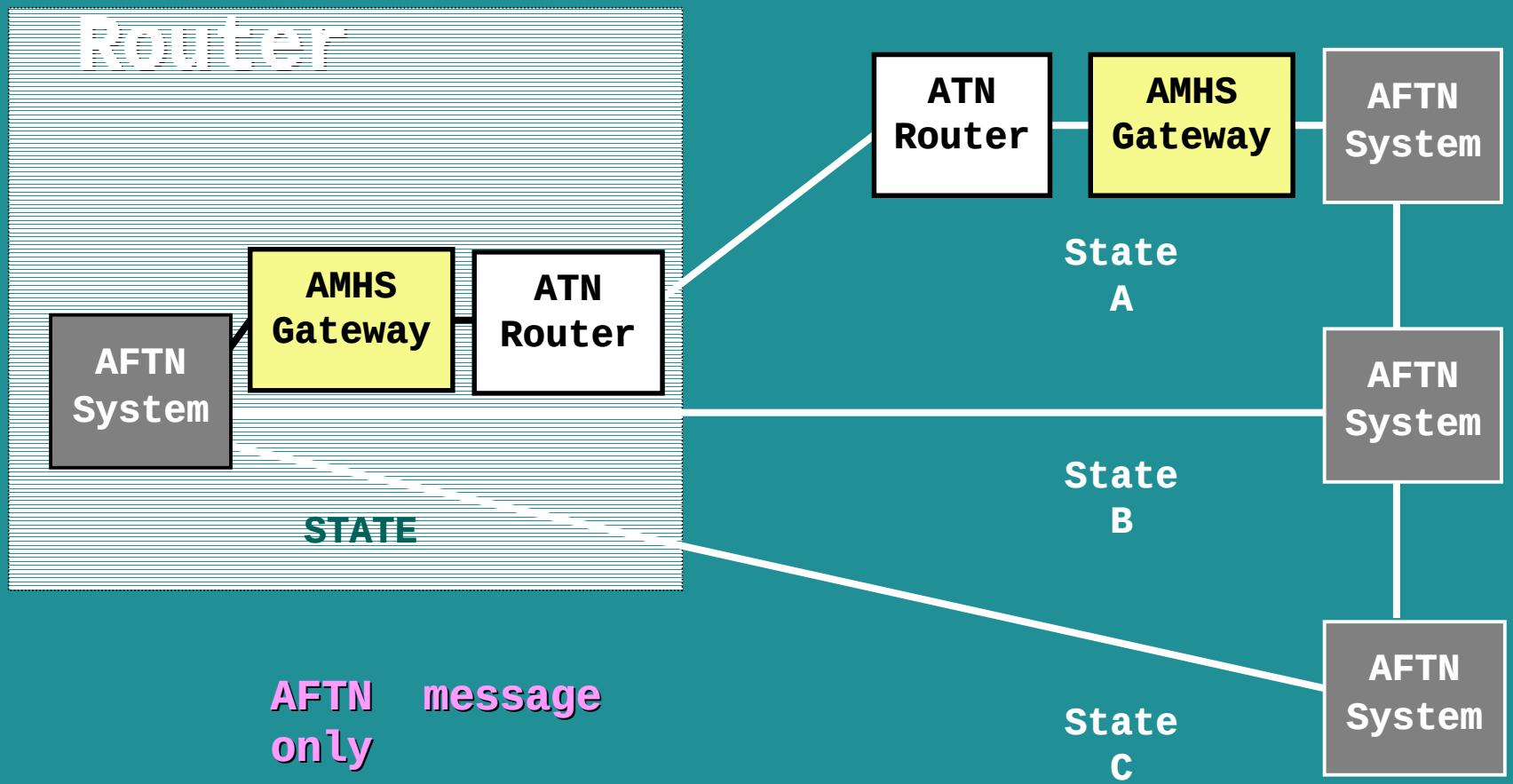
Regional AMHS Transition (2/11)

- Phase-1 : Current AFTN Connections



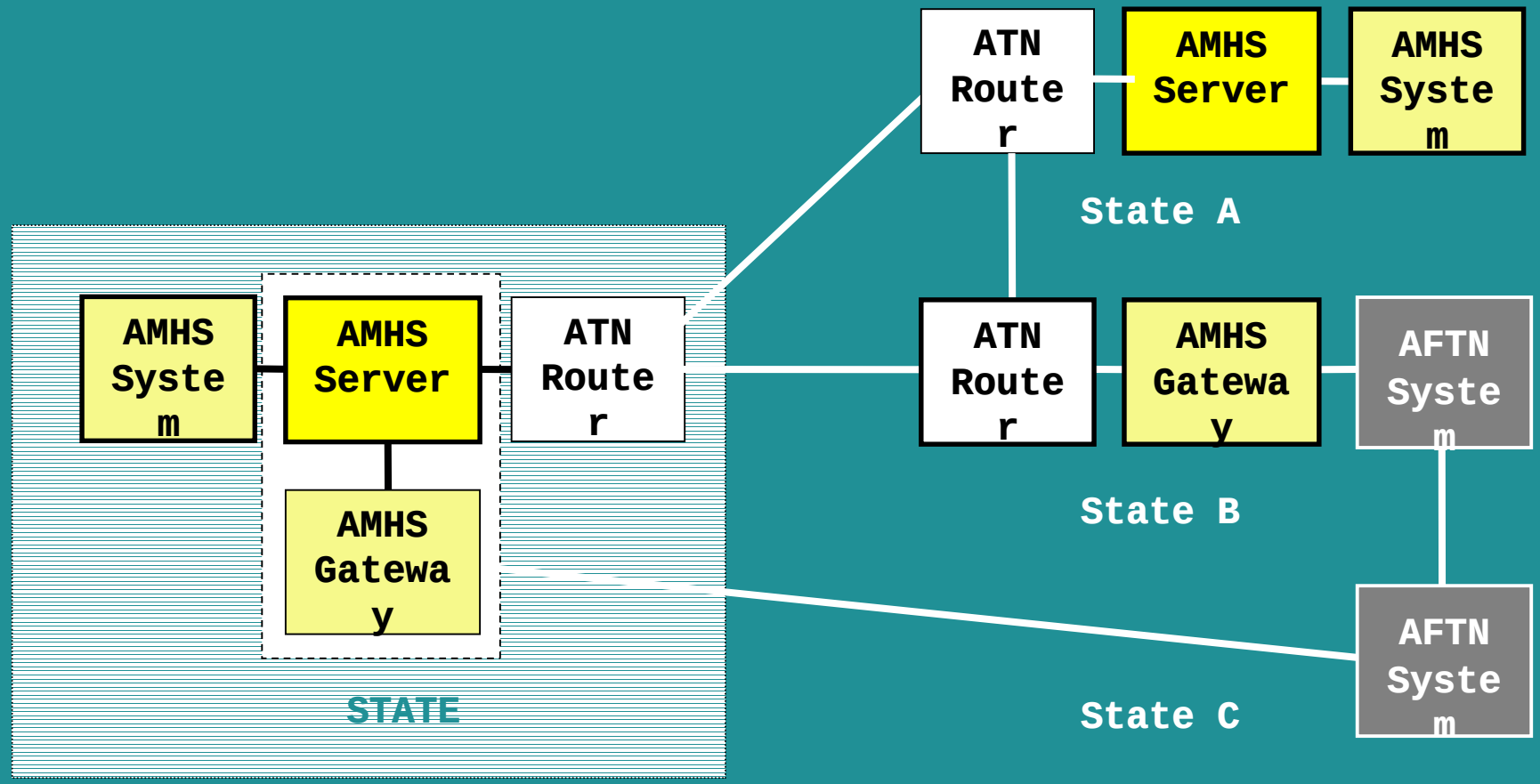
Regional AMHS Transition (3/11)

- Phase-2 : Gateway & ATN



Regional AMHS Transition (4/11)

- Phase-3 : ATS Message Server

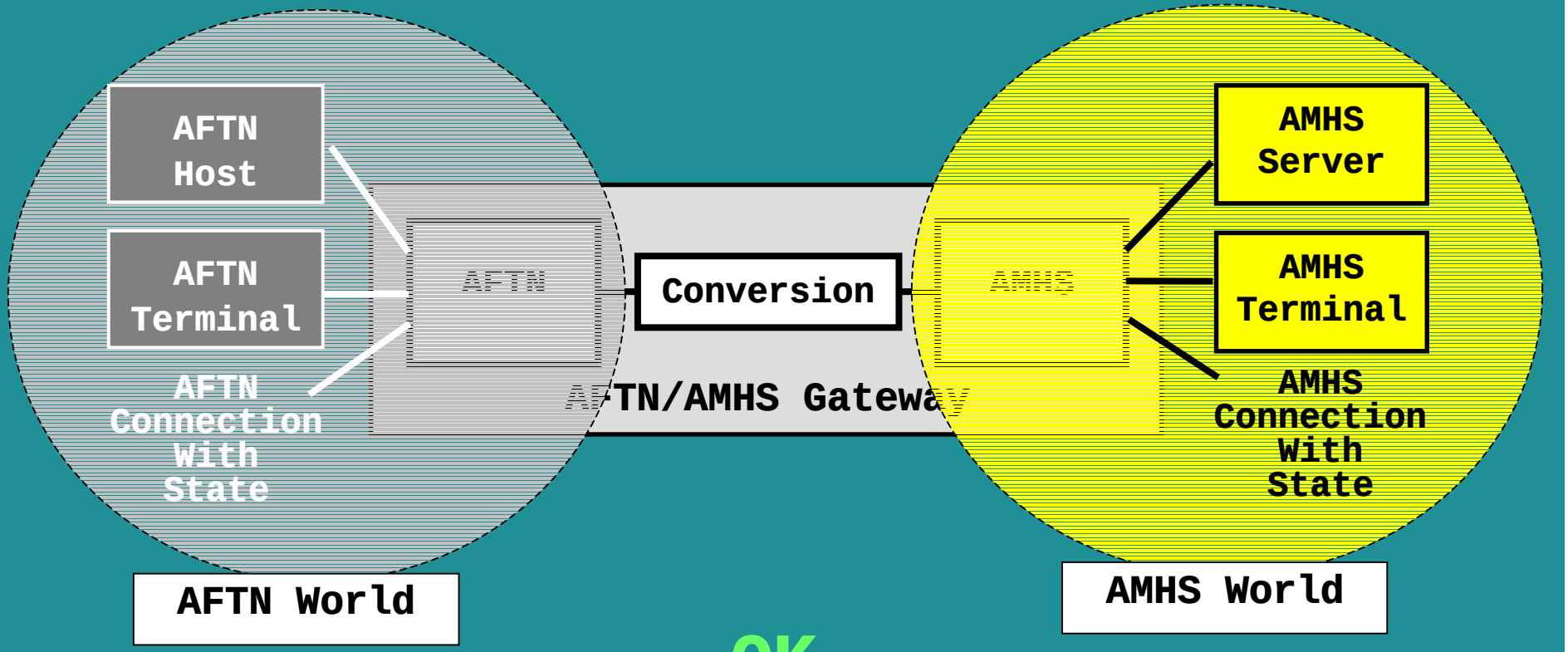


Regional AMHS Transition (5/11)

- AFTN/AMHS Message exchange
  - AFTN Connection
    - AFTN Message in AFTN Format via AFTN protocol
      - Character only (max. 2,100 chars/ 1,800 chars contents)
  - AMHS Connection
    - AFTN Message in AMHS Format via AMHS protocol
      - AMHS Header + Capsulated AFTN Message
    - AMHS Message in AMHS Format via AMHS protocol
      - Binary data (max. 15,000 bytes as an example)
      - Characters, image, graphic, etc.
      - Bilateral and/or Regional Operational Provisions are necessary
    - No AMHS message in AFTN Format

Regional AMHS Transition (6/11)

- AFTN/AMHS Message exchange



AFTN message in AFTN format

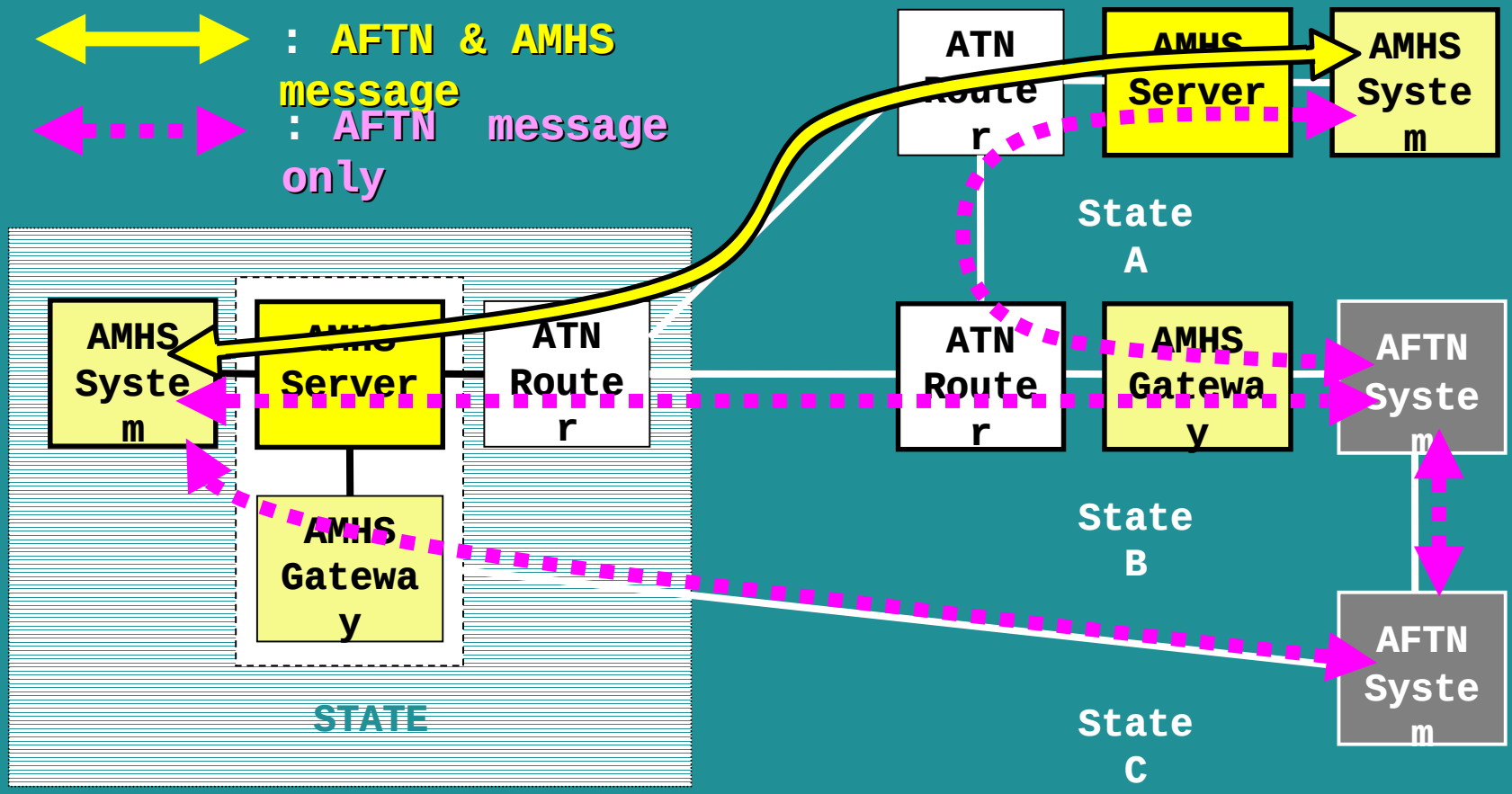
OK

NG

AFTN message in AMHS format
and
AMHS message in AMHS format

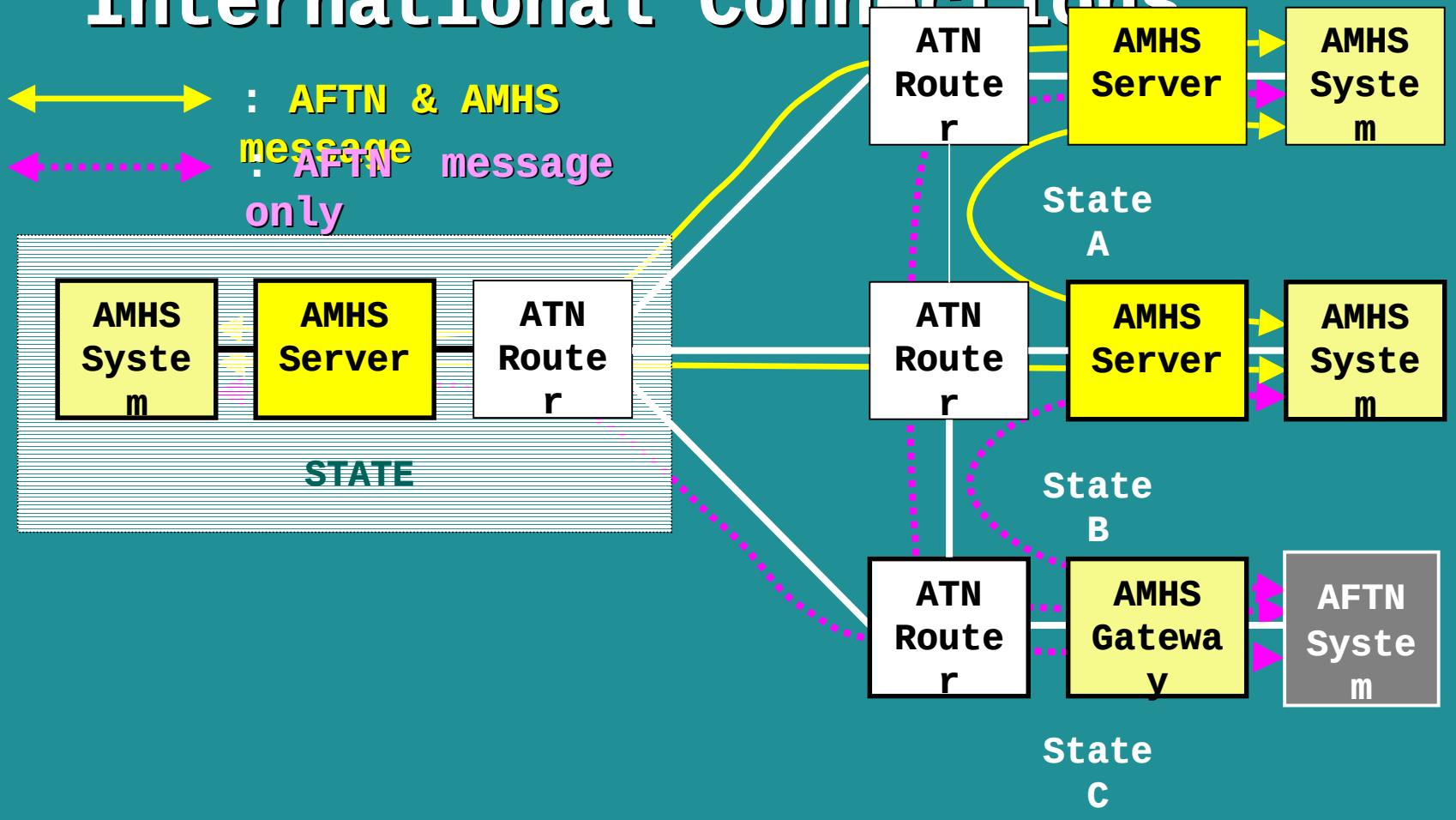
Regional AMHS Transition (7/11)

- Message flow of Phase-3



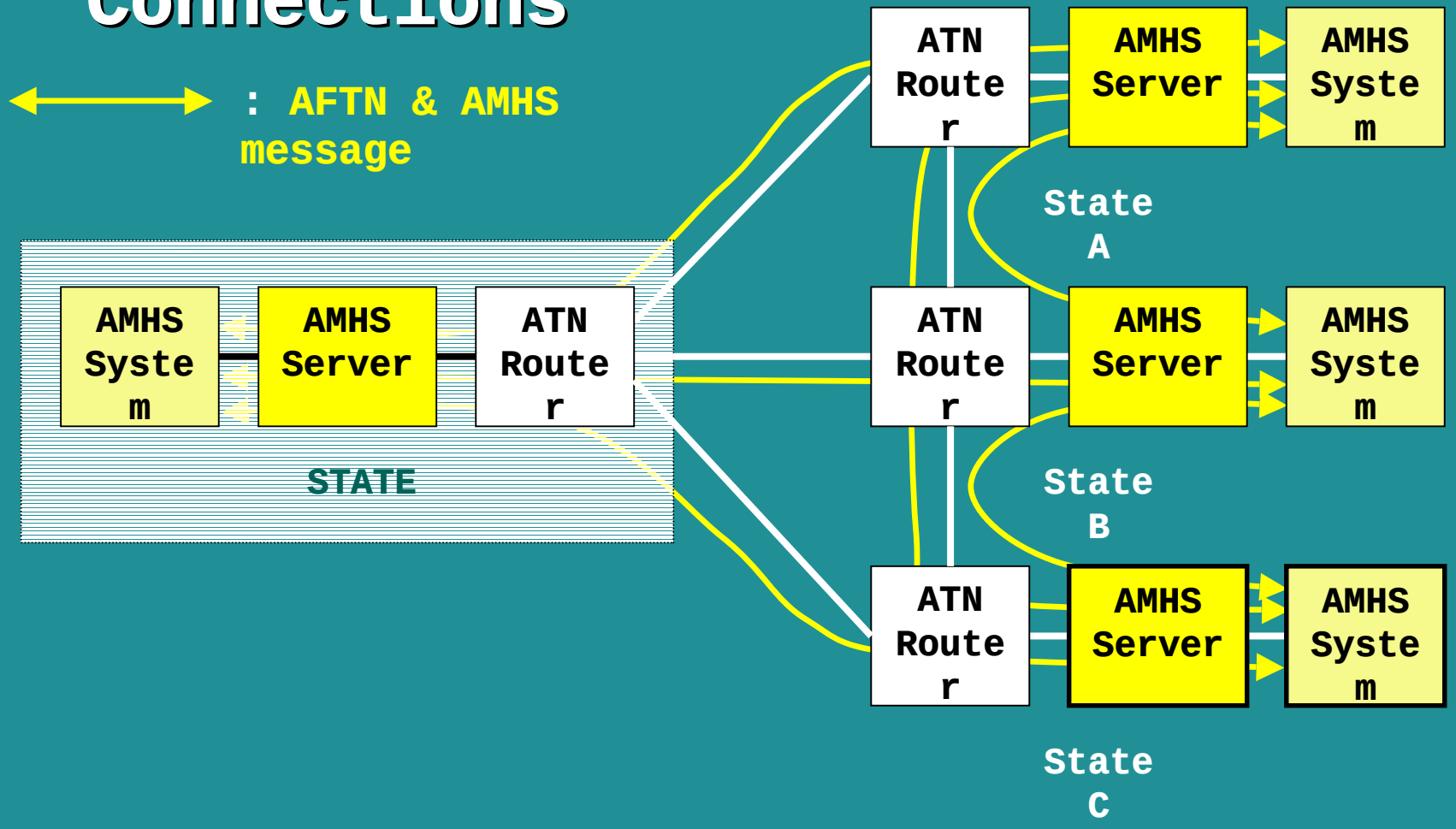
Regional AMHS Transition (8/11)

- Phase-4 : Full AMHS International Connections



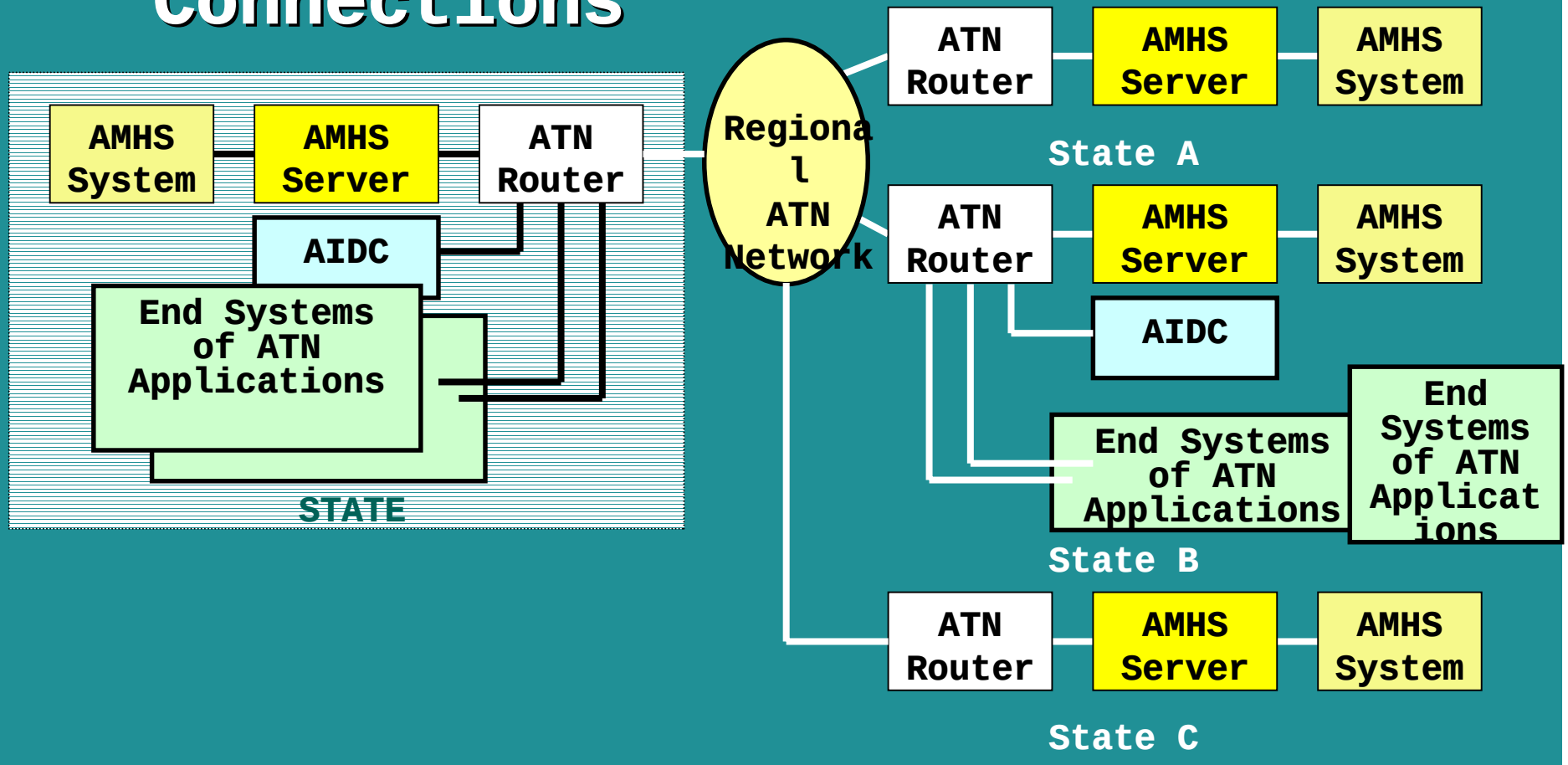
Regional AMHS Transition (9/11)

- Phase-5 : Full AMHS Connections



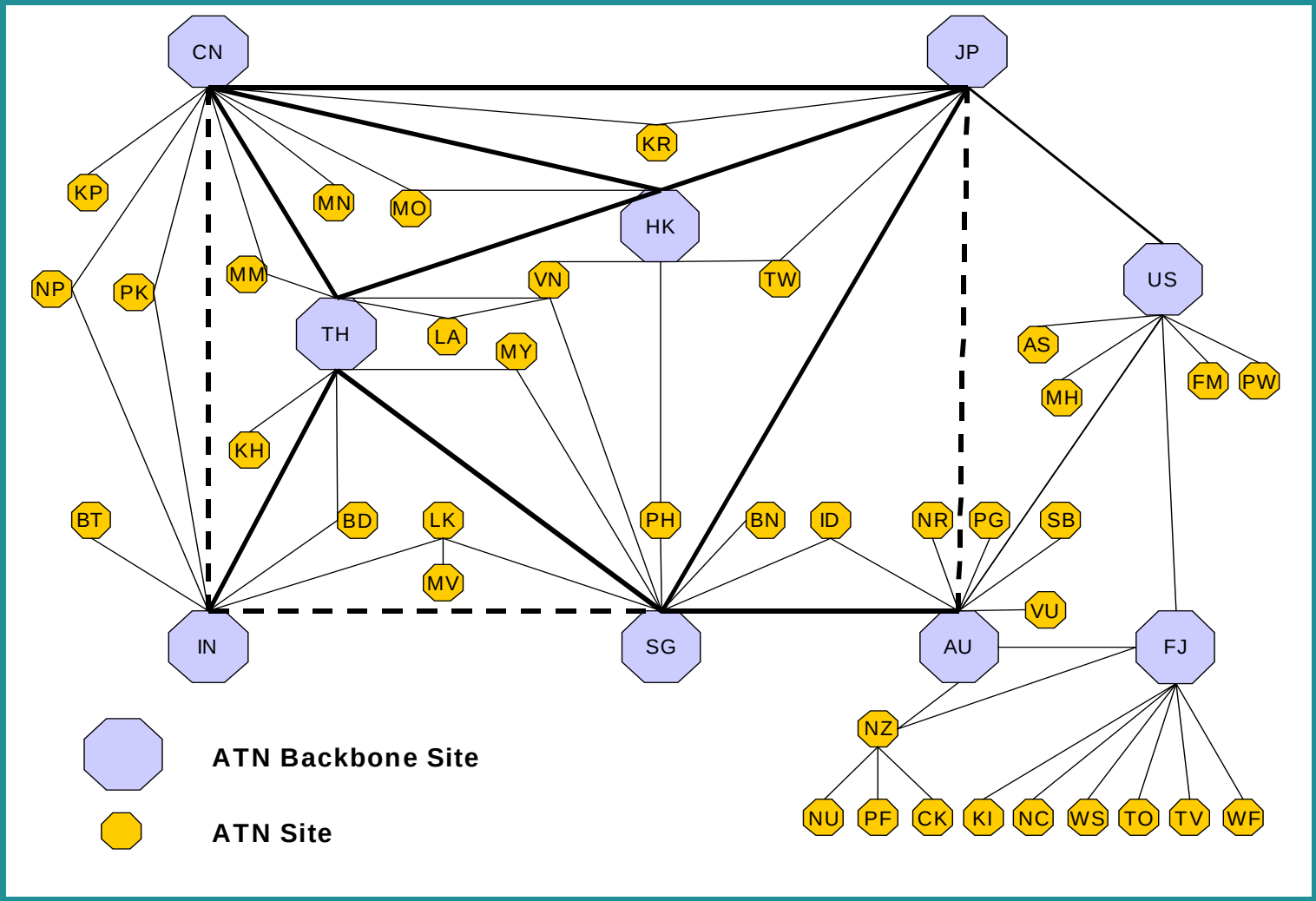
Regional AMHS Transition (10/11)

- Phase-6 : Full ATN Connections



Regional AMHS Transition (11/11)

- Regional ATN Network

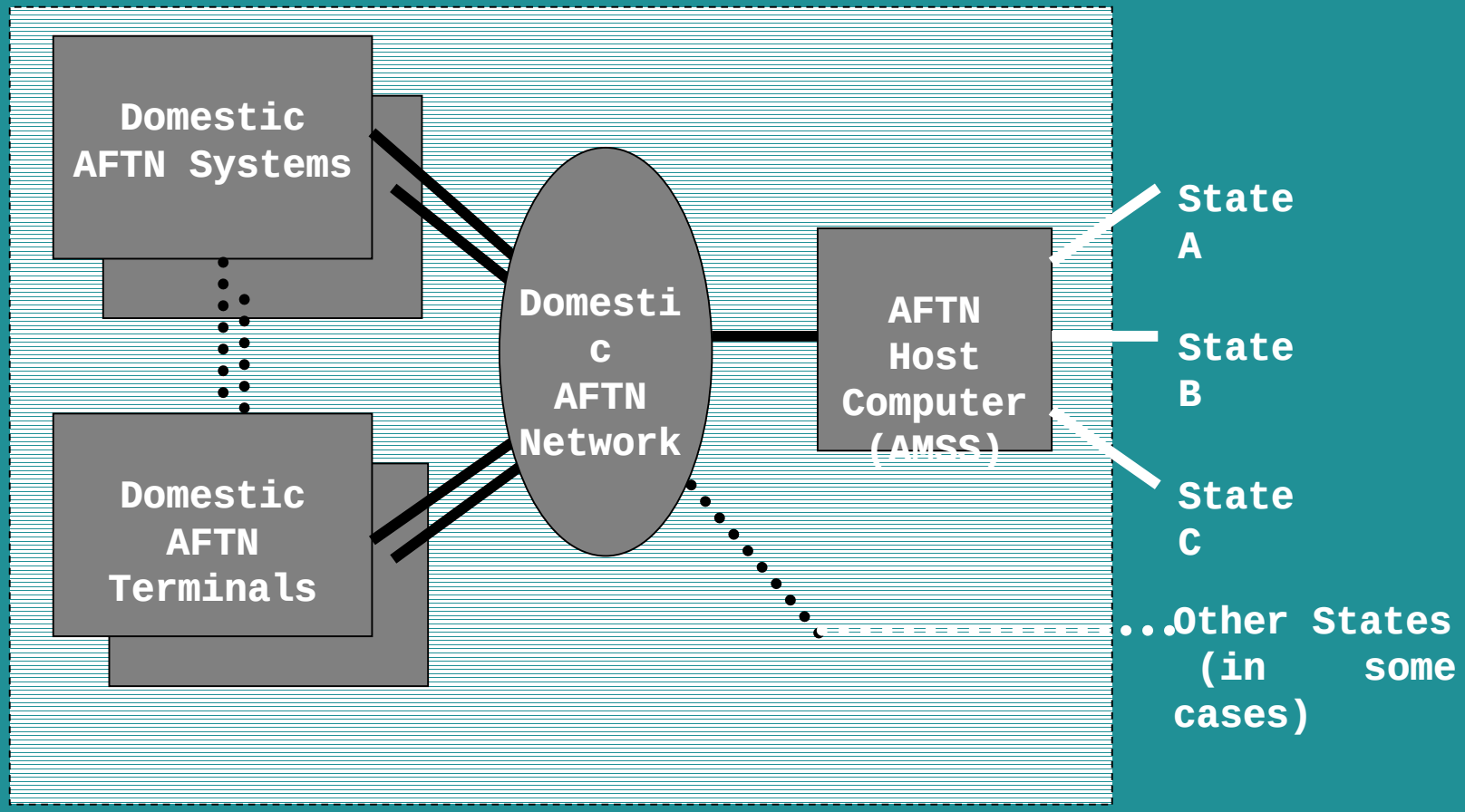


Domestic AMHS Transition (1/9)

- Domestic Transition from AFTN to AMHS
  - AFTN Connections
  - AFTN Connections with AFTN/AMHS Gateway
  - AMHS Connections with AFTN/AMHS Gateway and ATS Message Server
  - AMHS Domestic Connection
- Some Other Cases
  - X.400 MHS (non ATN) Domestic Connection
  - TCP/IP (non ATN) Domestic Connection

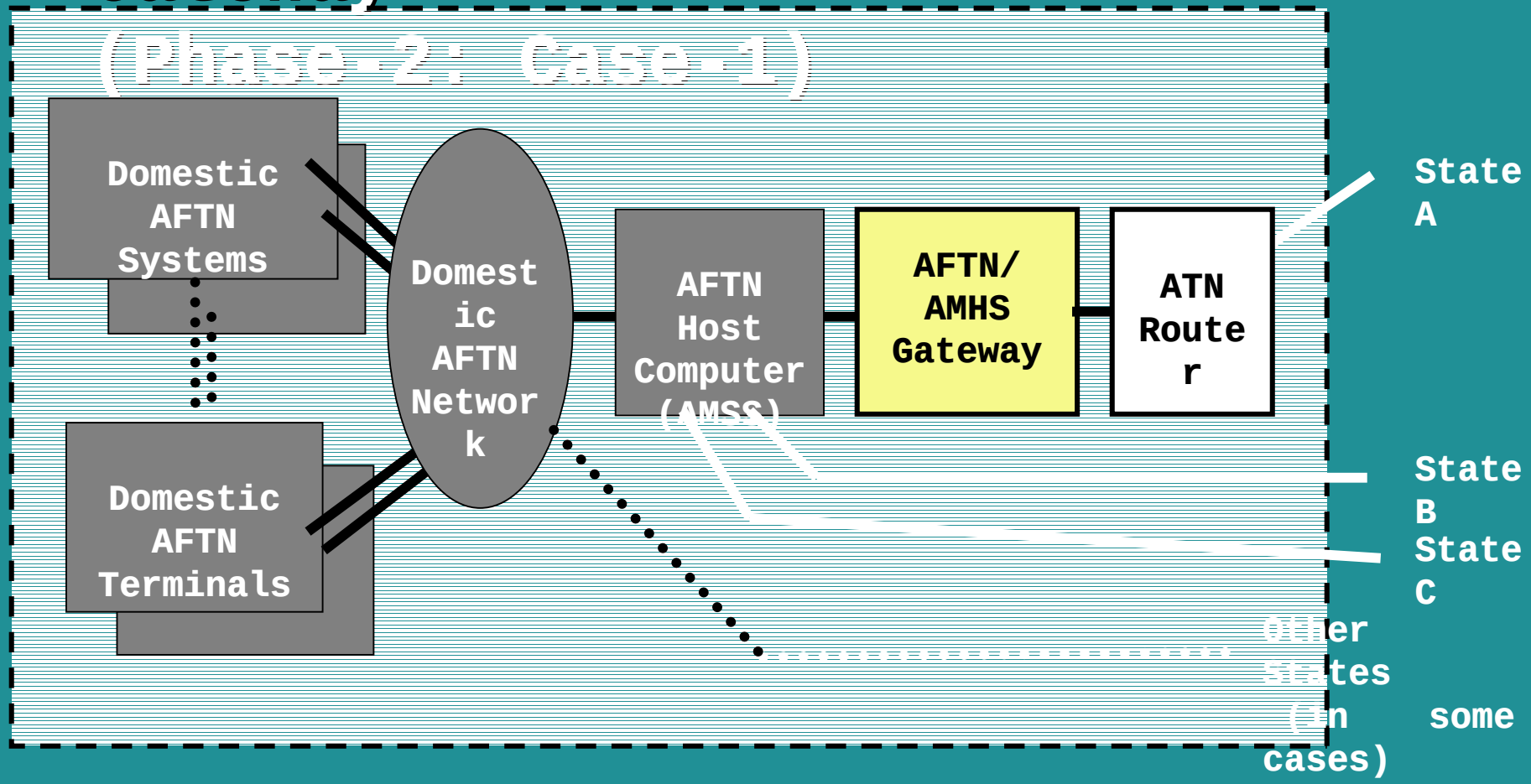
Domestic AMHS Transition (2/9)

- AFTN Connections (Phase-1)



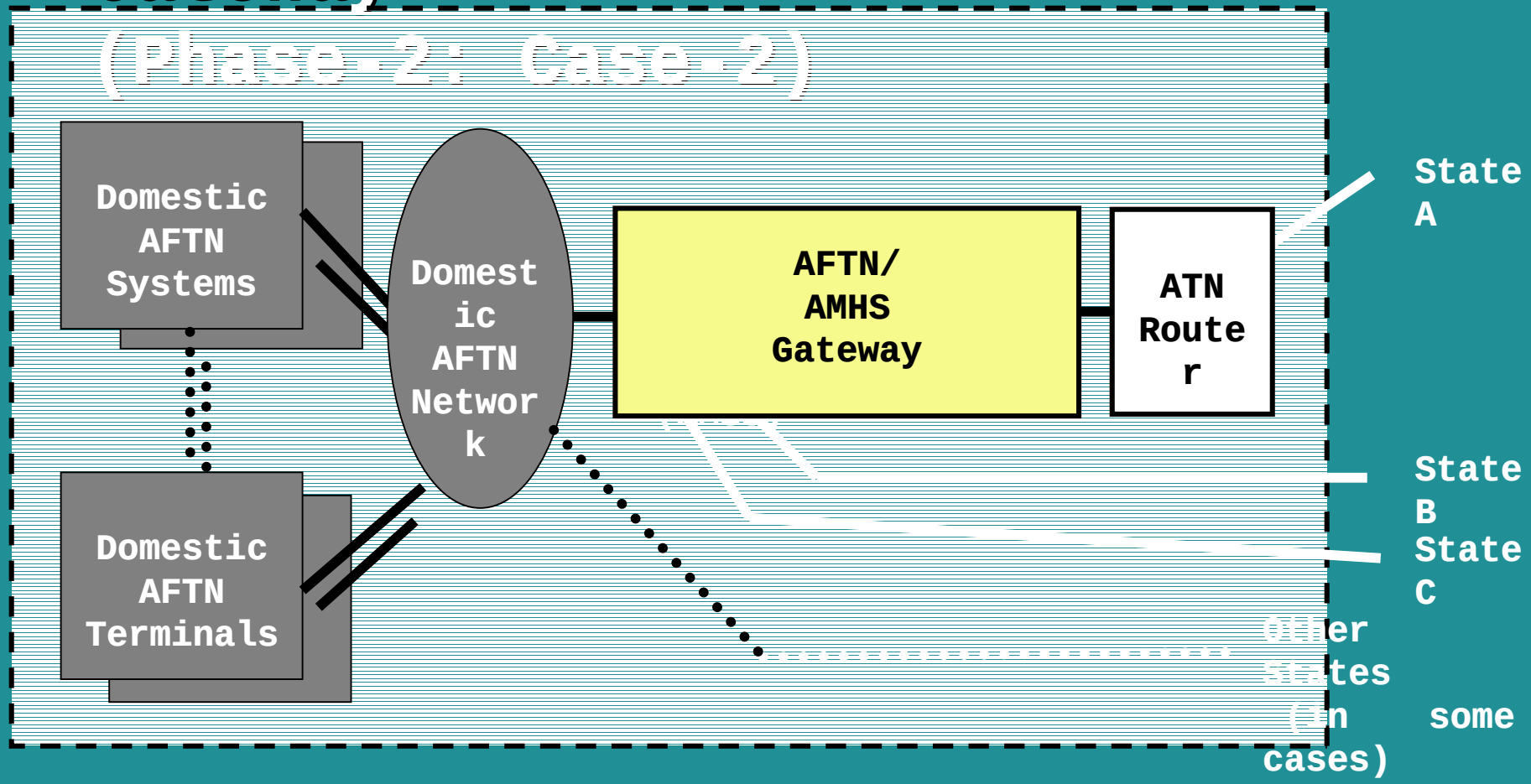
Domestic AMHS Transition (3/9)

- AFTN Connections with AFTN/AMHS Gateway



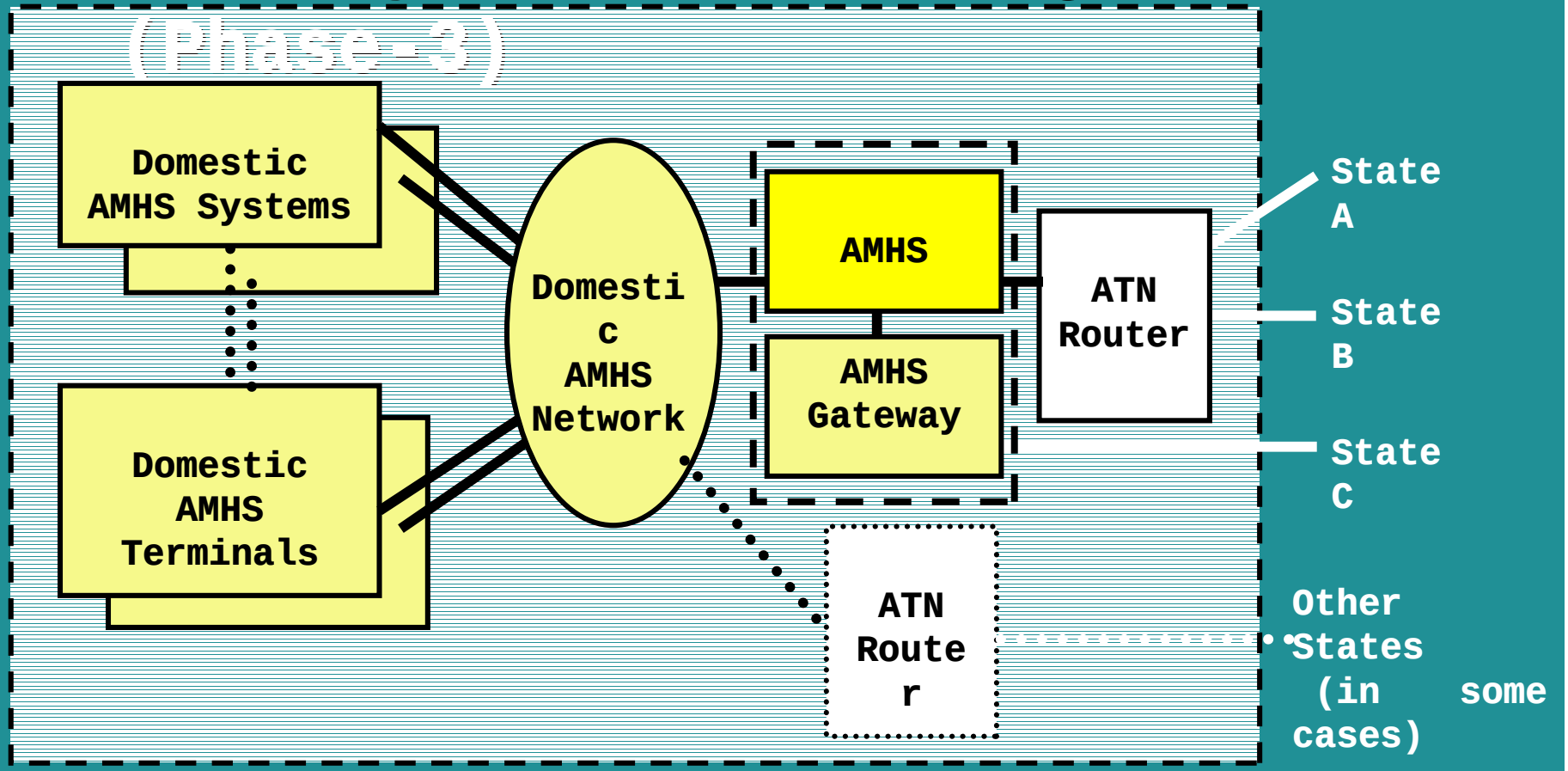
Domestic AMHS Transition (4/9)

- AFTN Connections with AFTN/AMHS Gateway



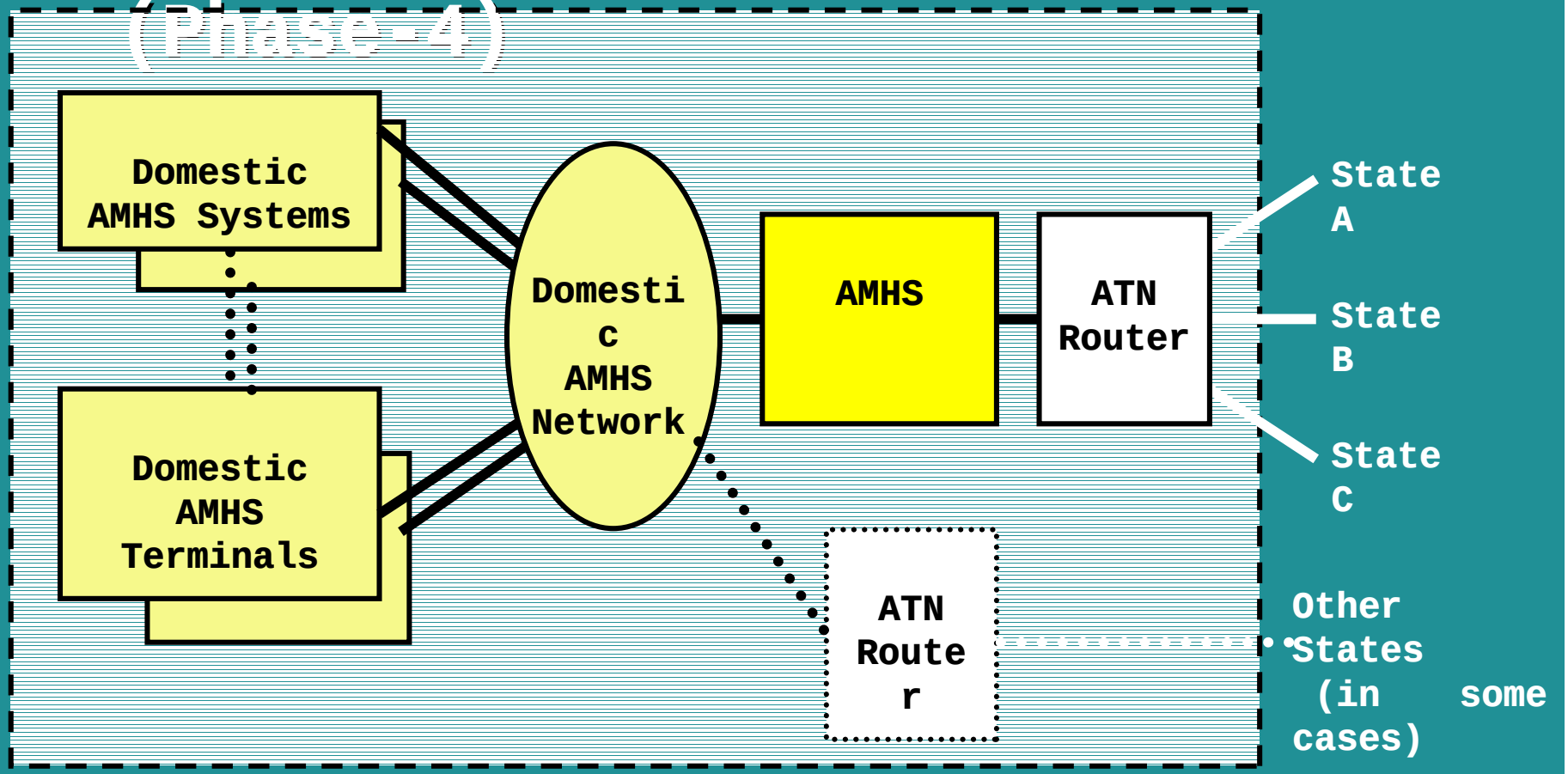
Domestic AMHS Transition (5/9)

- AMHS Connections with AFTN/AMHS Gateway and ATS Message Server



Domestic AMHS Transition (6/9)

- AMHS Domestic Connection (Phase-4)

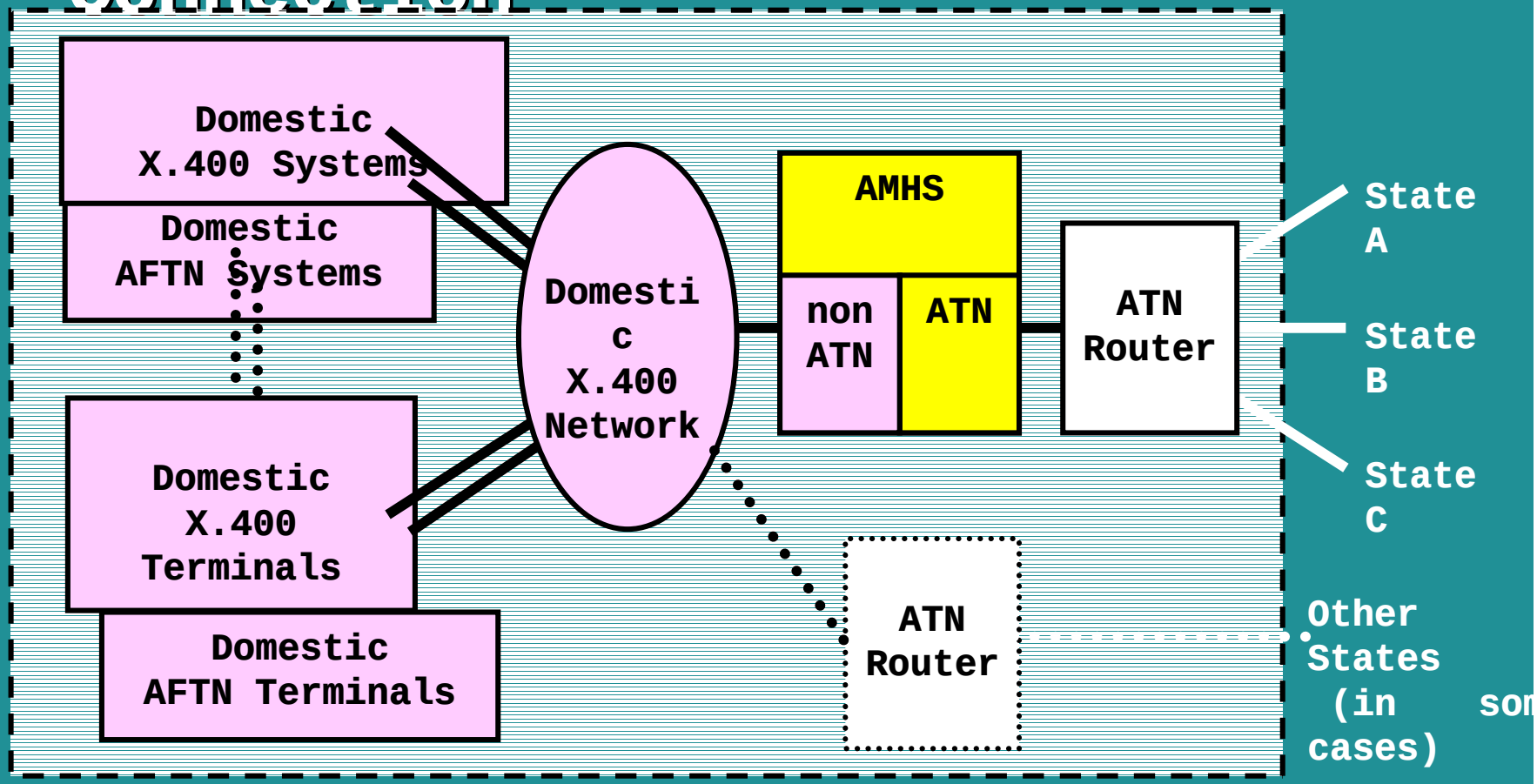


Domestic AMHS Transition (7/9)

- ATN
  - AMHS for International
  - AMHS for Domestic
- Other cases
  - AMHS for International
  - NON AMHS for Domestic
- NON AMHS Candidates for Domestic Use
  - X.400 MHS (non ATN)
  - TCP/IP (non ATN)

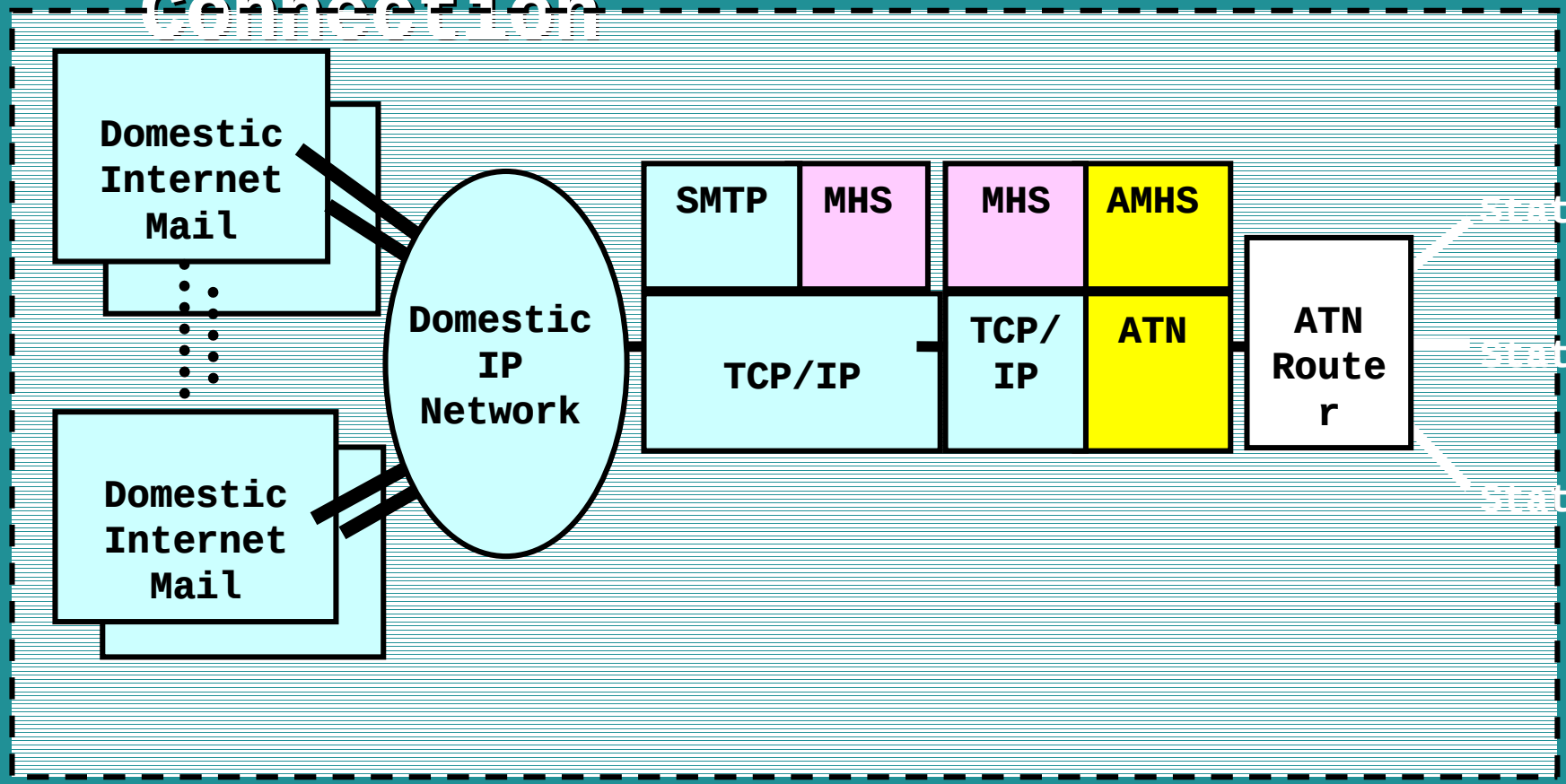
Domestic AMHS Transition (8/9)

- X.400 MHS (non ATN) Domestic Connection



Domestic AMHS Transition (9/9)

- TCP/IP (non ATN) Domestic Connection

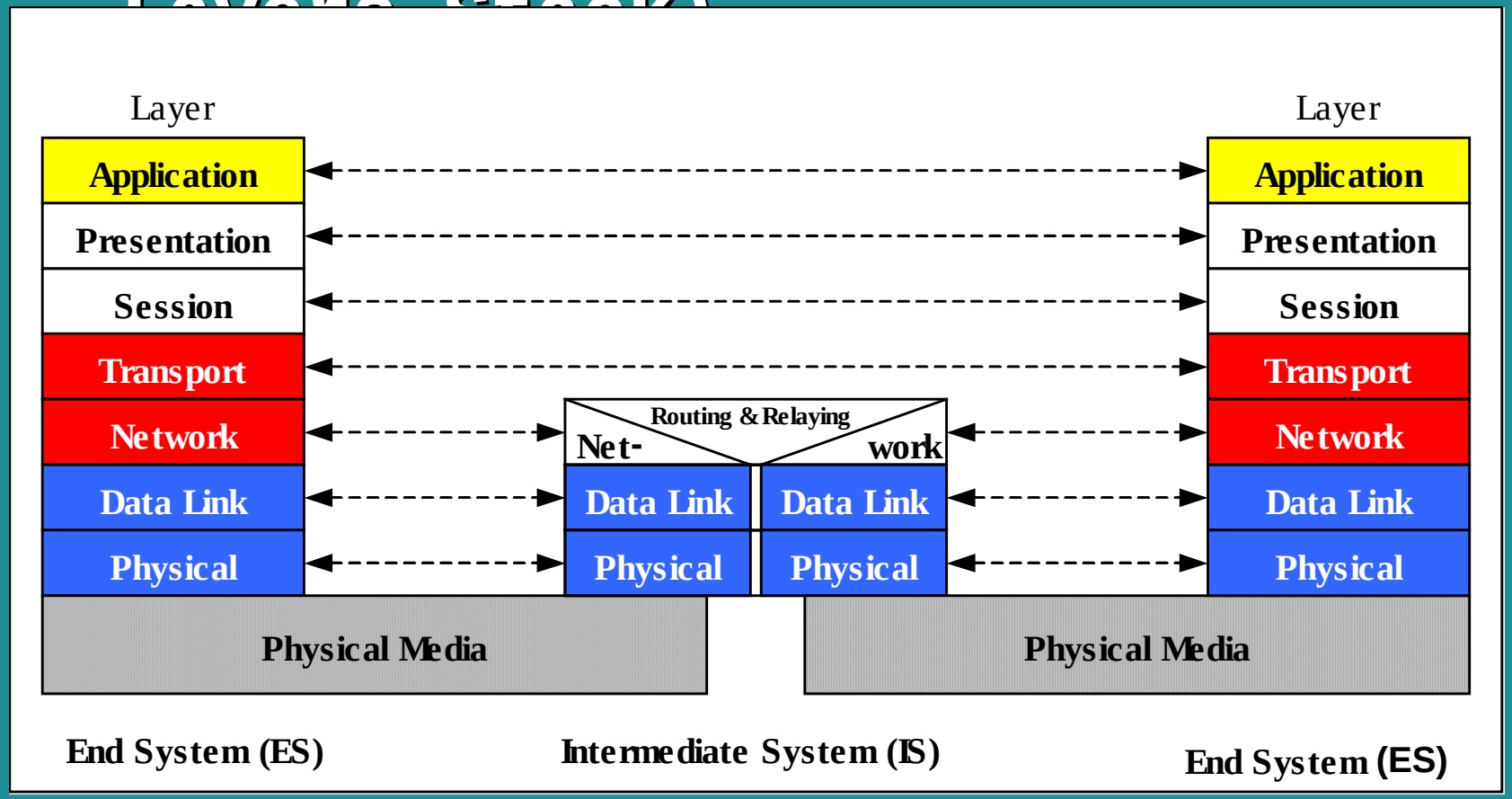


Special Features of AMHS (1/7)

- ATN
  - Common Internet Communication Infrastructure for all the ATN Applications
    - CM, CPDLC, ADS, FIS
    - AIDC (ICC), AMHS
  - International Standards PLUS Aeronautical requirements
- COTS (Commercial Off the Shelf)
  - International Standards only

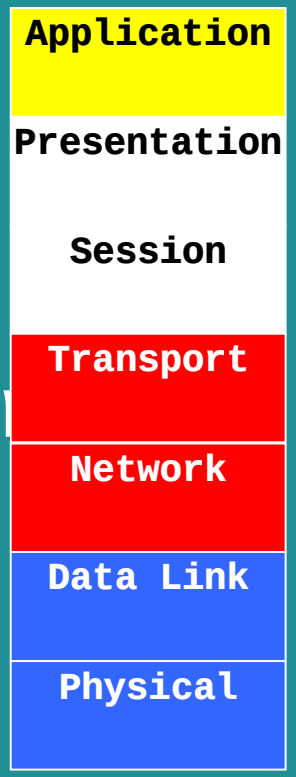
Special Features of AMHS (2/7)

- OSI Referenced Model (7 Layers Stack)



Special Features of AMHS (3/7)

- Application Layer
  - Not X.400 but AMHS (Subset of X.400)
  - AFTN/AMHS Gateway
  - CIDIN/AMHS Gateway (not applicable)
- Transport and Network Layer
  - Support of Security and priority

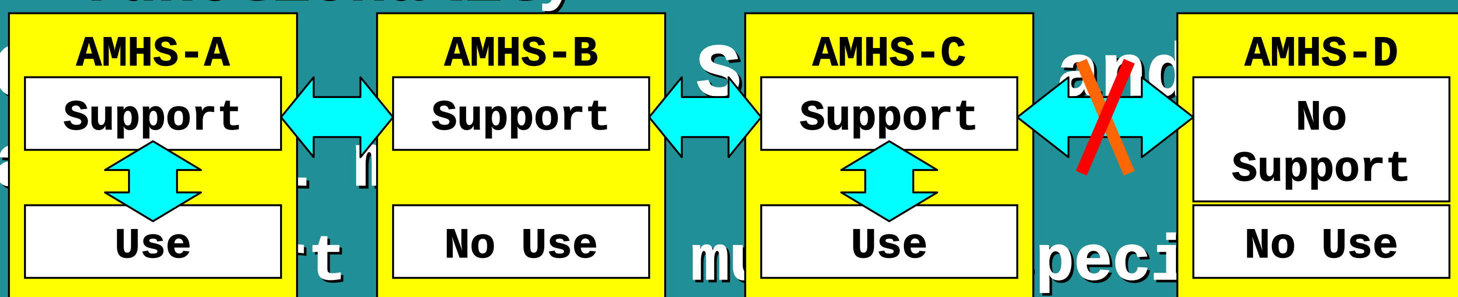


Special Features of AMHS (4/7)

- AMHS specification
  - SARPs (Doc9705) and CAMAL (Doc9739)
  - ITU-T and ISO/IEC Standards
  - Regional ICD (Interface Control Document)
- Interoperability
  - World Wide : SARPs, Standards
  - Regional : ICD
  - Bi-lateral : Agreement on implementation schedule, operation, parameter settings etc.

Special Features of AMHS (5/7)

- Mandatory and Optional parameters
  - Mandatory : AMHS must Support and Use
    - Support when transfer message and Use functionality
  - (S … and … s a … l. m … t … mu … peci … locally



- AMHS ICD specifies all the Options for the interoperability within the region

Special Features of AMHS (6/7)

- AMHS ICD in Asia/Pacific Region
  - Guidance for AMHS specification
  - AMHS Specification
    - Guidance for Optional Parameters
    - AMHS Specification
    - Upper Layer Specifications
    - Lower Layer Specifications
  - PICS for AMHS
    - Protocol Implementation Conformance Statement
- Final Draft at the next 4th ATNTTF Meeting

Special Features of AMHS (7/7)

- Requirements to AMHS System Supplier
  - Fully comply with ICAO ATN SARPs
    - Full stack of ATN
    - Customized COTS products
    - ATN Router Interface
  - Fully comply with Regional AMHS ICD
  - Reliable for 365days / 24hours operation
    Well designed Human Machine Interface
  - Maintenance functions
    - Message Management, Statistics, Configuration, Monitoring, Message and Line Constraint, etc.

Some Considerations (1/2)

- AMHS or MHS (X.400)
  - ICAO specifies as the AMHS
  - Even one MHS disturbs Regional interoperability
  - AMHS for International Connections
- With or Without ATN Router
  - Limited function only at the earlier stage
  - At least one ATN Router in one domain
  - With ATN Router for future expandability

Some Considerations (2/2)

- Alternative route
  - Alternative route for back up routing
  - Enough line speed for AMHS overhead
    - Example : 500 characters
      AFTN : 500+33
      AMHS : 500+33+538
  - AMHS overhead for more functionality
- Routing by ATN Router or AMHS
  - ATN Router : Internet level (implicit)
  - AMHS : Information level (explicit)

Conclusions

- AMHS is the replacement of AFTN
- AMHS must comply with ICAO ATN SARPs and Regional AMHS ICD
- ATN Router Connection is essential for the future flexibility and expandability
  - Regional ATN Network for both AMHS and other ATN Applications
- Close coordination between States is necessary for AMHS implementation

- Thank you for your kind attention -