



# Fault tolerant time distribution on dual transport network

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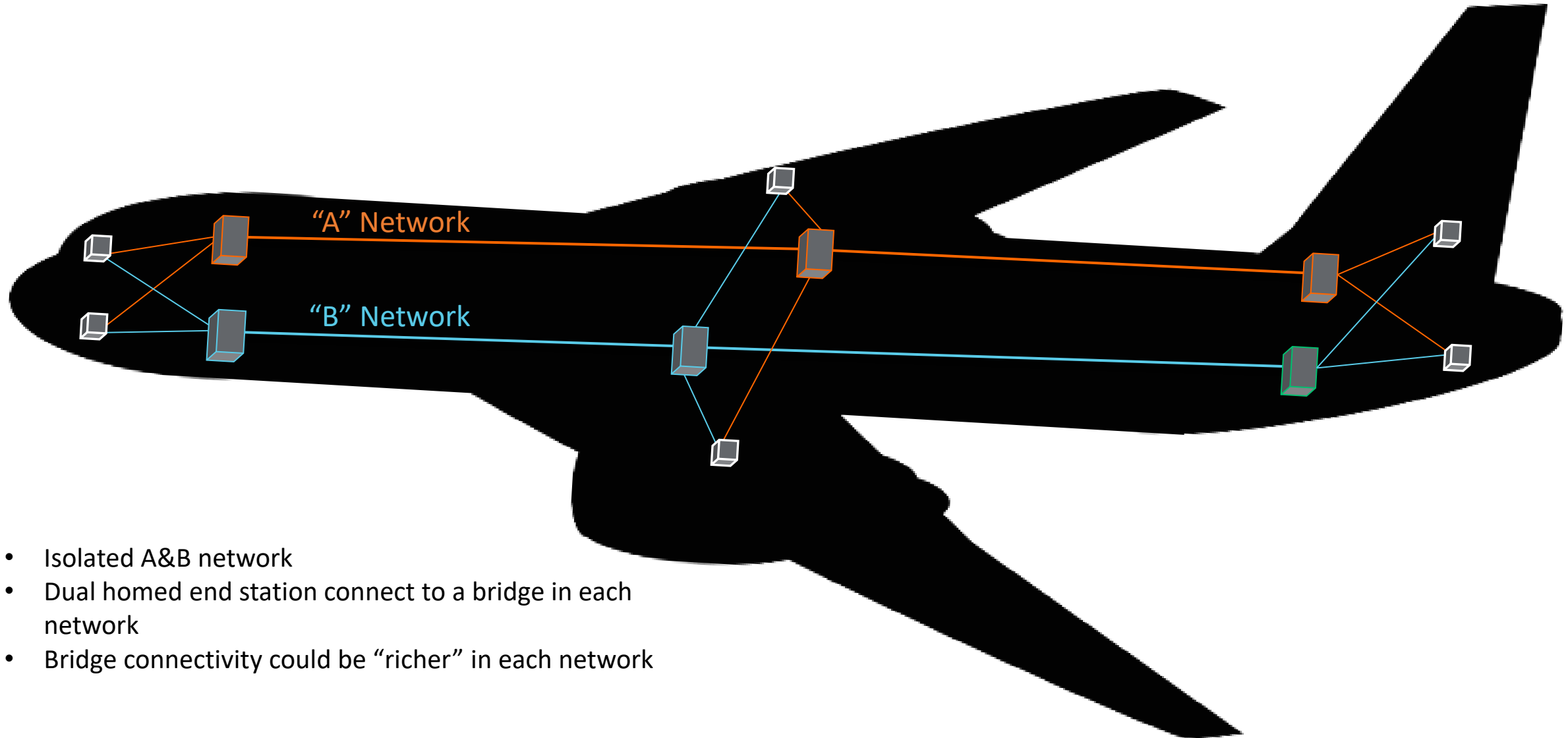
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# Objective

- Example of fault tolerant time distribution for avionics networks
  - In particular, dual redundant networks
- Show feasible architecture using DP proposed components

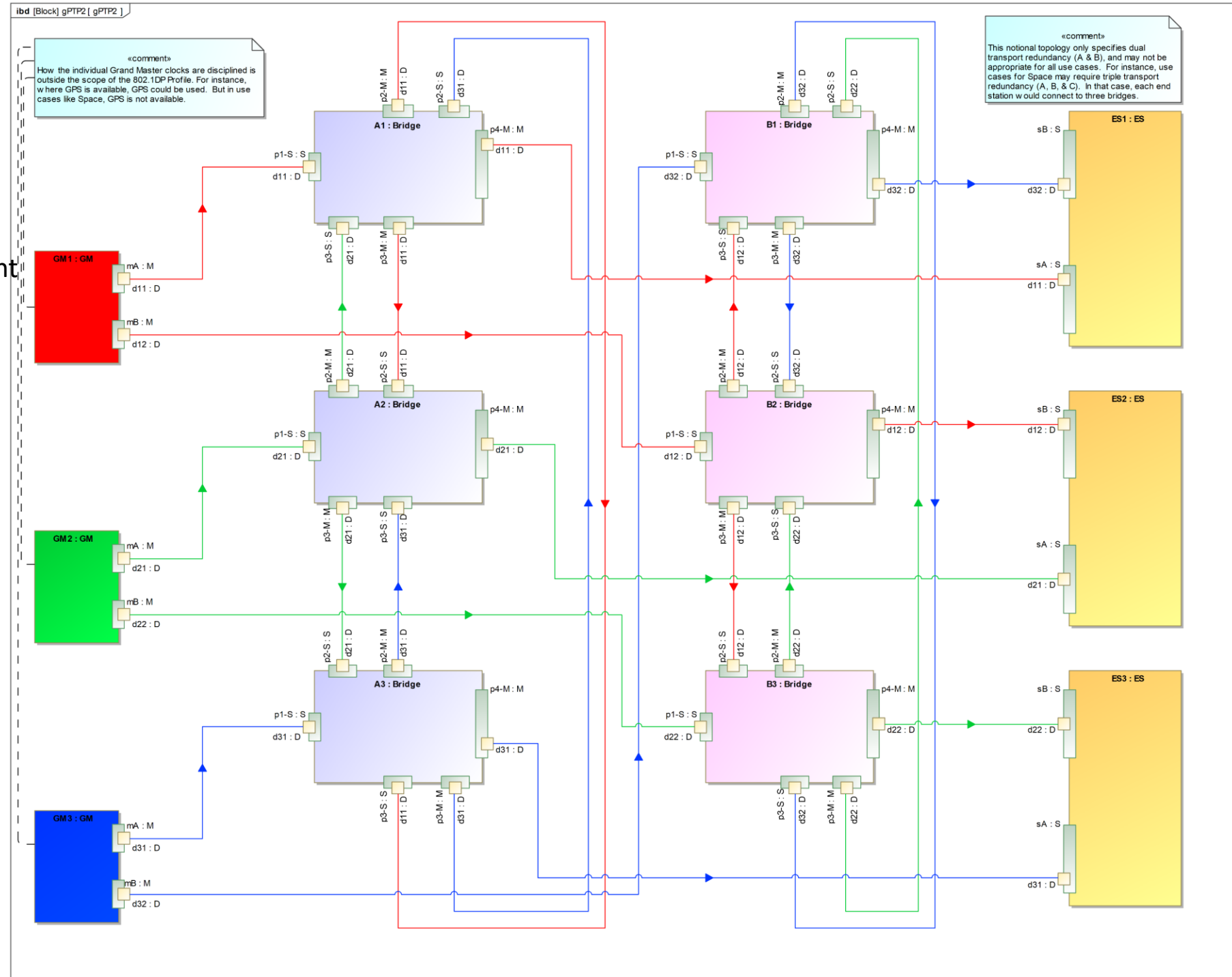
# Dual Redundant Transport Networks



- Isolated A&B network
- Dual homed end station connect to a bridge in each network
- Bridge connectivity could be "richer" in each network

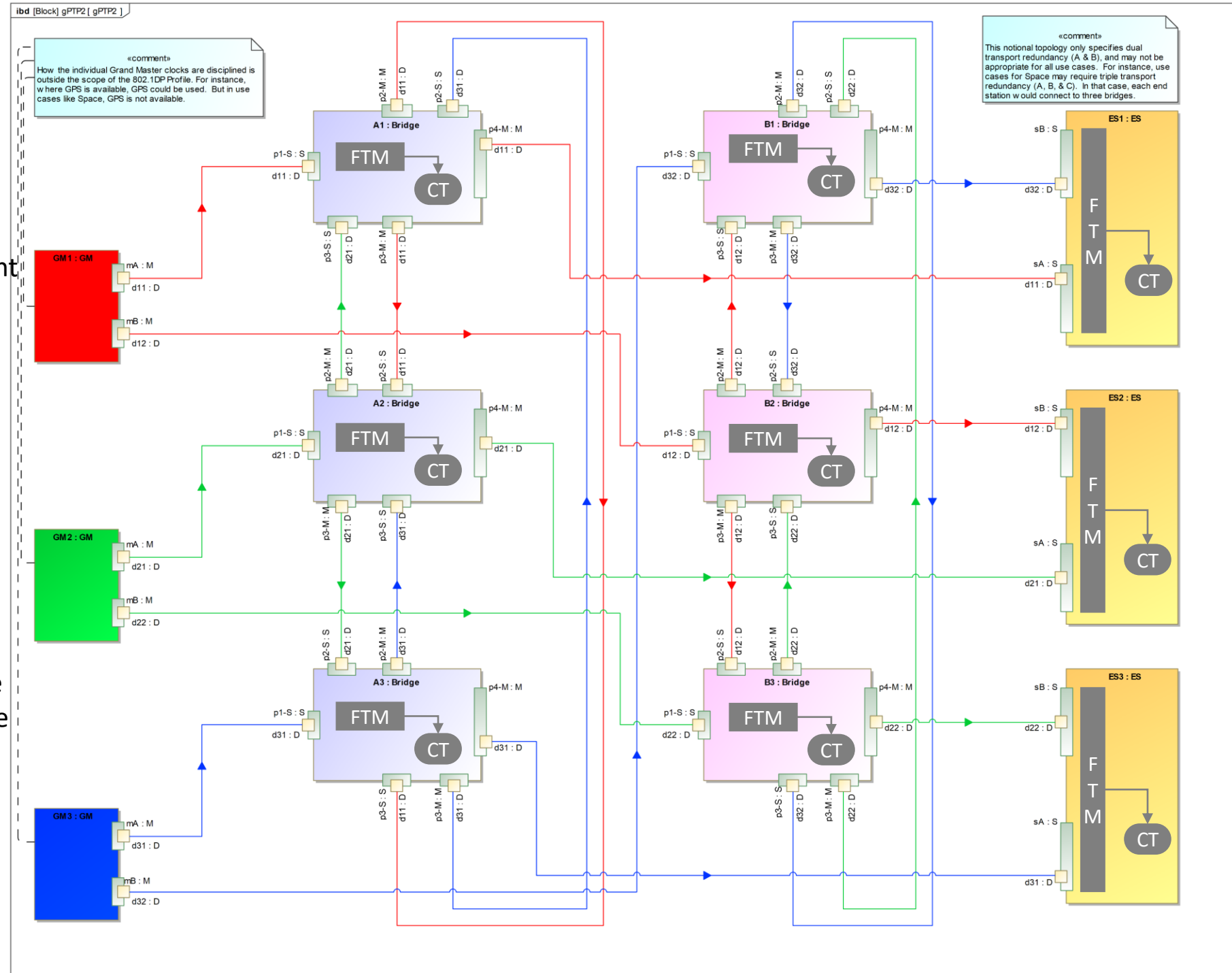
# Example Use Case # 1

- Distributed redundant transport
- Triple redundant independent GMs
  - 3 independent domains (red, green, blue)
  - Domain numbers are coded to identify independent and dependent domains
- Each end station has two PTP end instances (one on each port)
  - Uses different domain numbers for each PTP instance. Although it is possible to have the same domain number
- Each bridge has 3 PTP instances (one relay and 2 end instances)



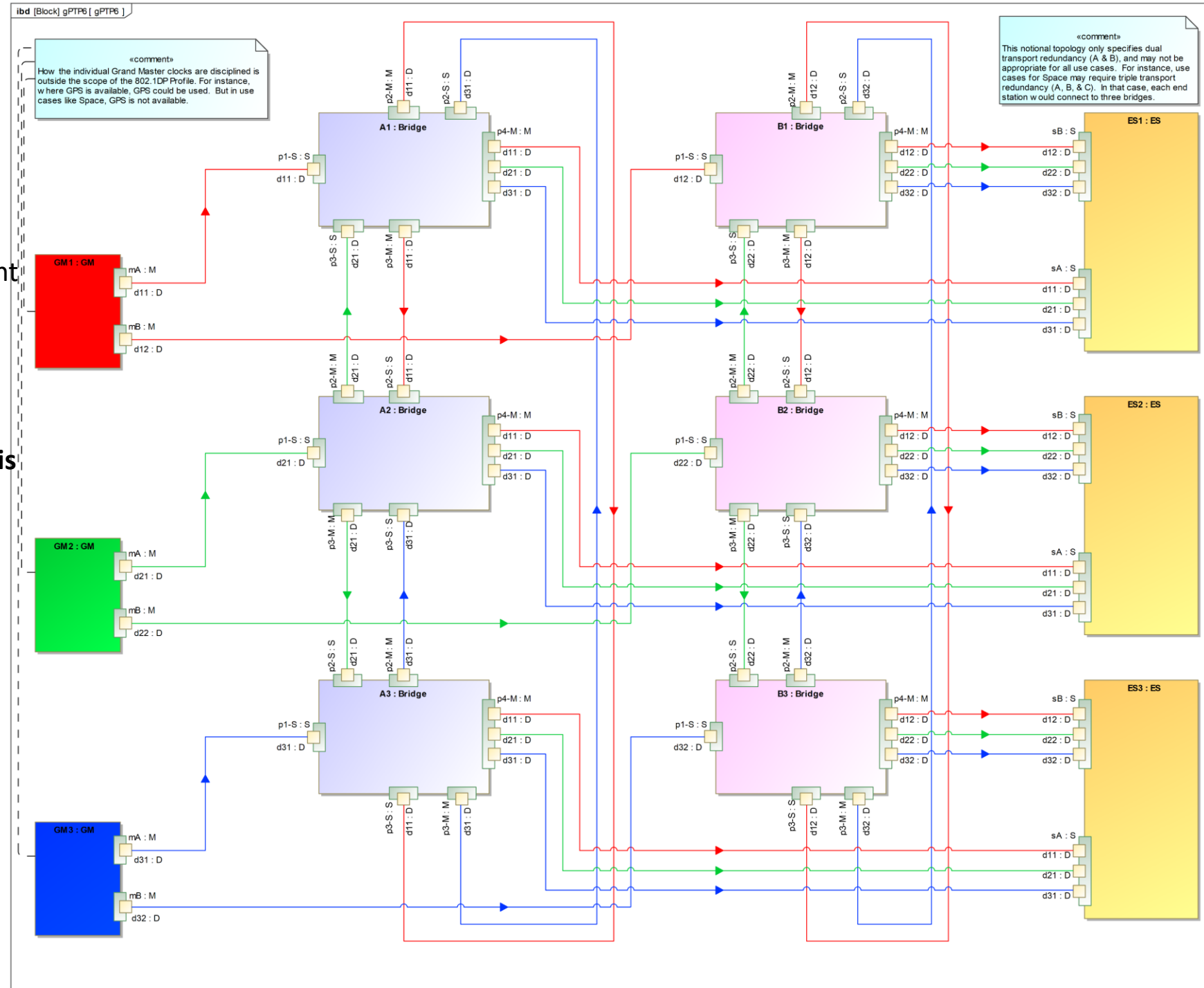
# Example Use Case # 1

- Distributed redundant transport
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  - Domain numbers are coded to identify independent and dependent domains
- Each end station has two PTP end instances (one on each port)
  - Uses different domain numbers for each PTP instance. Although it is possible to have the same domain number
- Each bridge has 3 PTP instances (one relay and 2 end instances)
- Every time-aware entity has a fault tolerant module operating on available PTP instances to determine “best” time
  - Fault tolerant module maximizes availability and integrity
  - FT module on bridges does not change PTP relay behavior



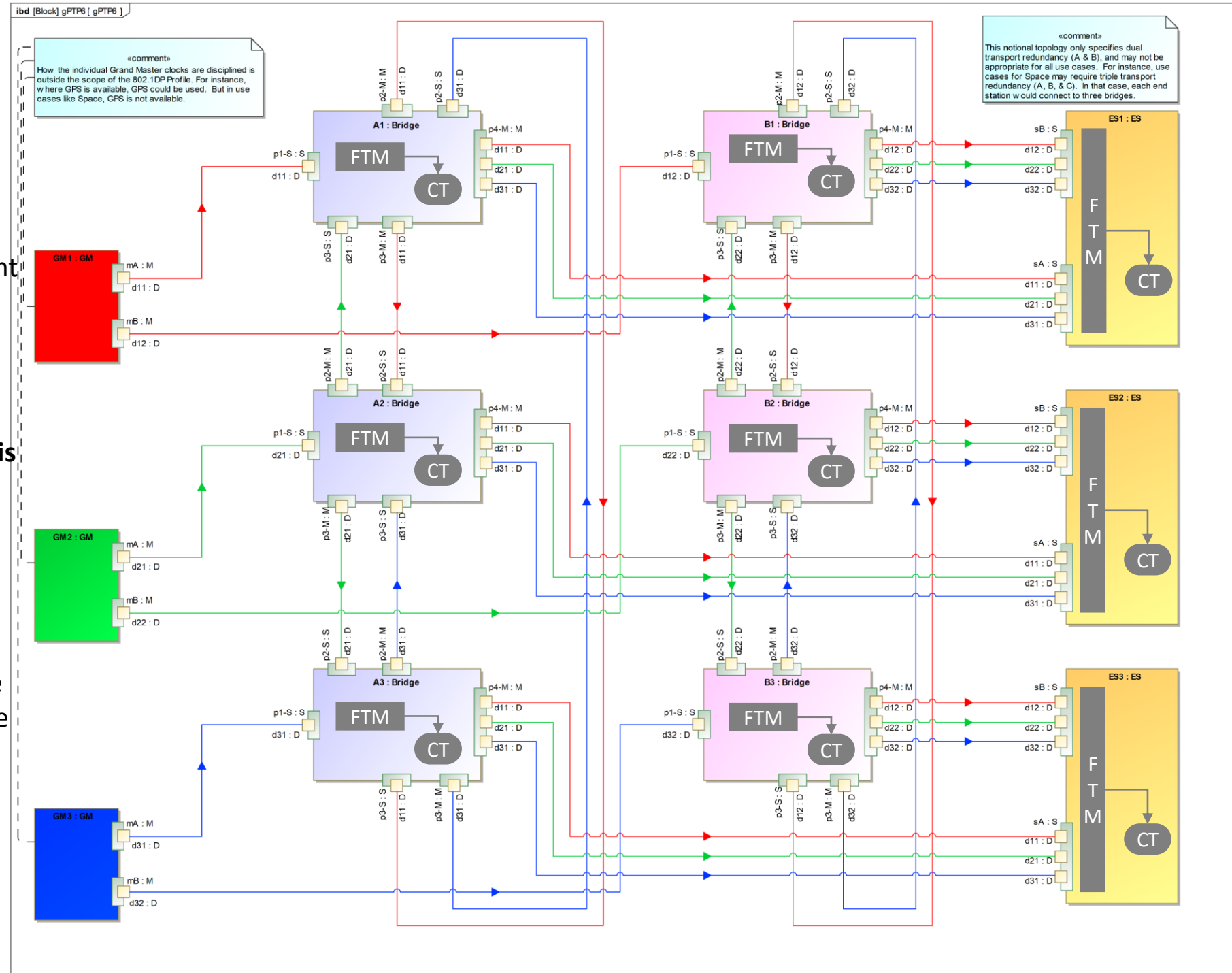
## Example Use Case # 2

- Distributed redundant transport
- Triple redundant independent GMs
  - 3 independent domains (red, green, blue)
  - Domain numbers are coded to identify independent and dependent domains
- Each end station has six PTP end instances (3 on each port)
  - Uses 6 different domain numbers for each PTP instance. Although it is possible to have only 3 domain numbers
- Each bridge has 3 PTP instances (one relay and 2 end instances)



## Example Use Case # 2

- Distributed redundant transport
- Triple redundant independent GMs
  - 3 independent domains (red, green, blue)
  - Domain numbers are coded to identify independent and dependent domains
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- Each bridge has 3 PTP instances (one relay and 2 end instances)
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  - Fault tolerant module maximizes availability and integrity
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# Summary

A design pattern for aerospace time sync distribution on dual redundant transport networks was presented