P5- MID OPMET Traffic and Optimum Routing

ICAO Regional OPMET Centre (ROC) Workshop
Jeddah, Saudi Arabia, 31. August-1. September 2014

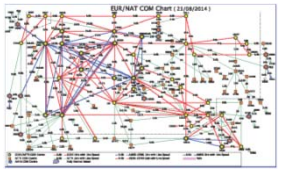
Agenda

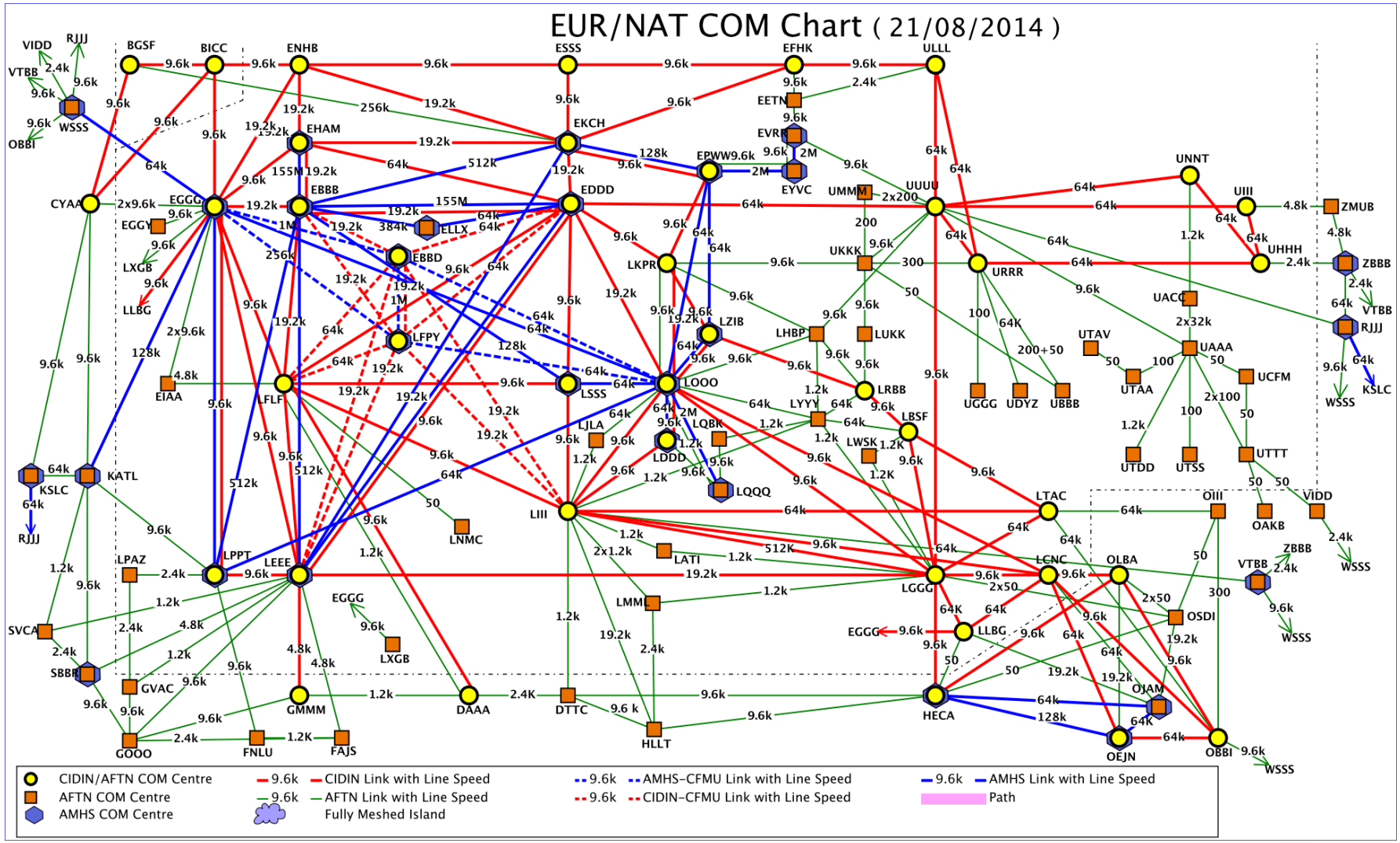
- AFS Communication
- EUR – MID Connectivity
- OPMET Data Statistics
- Vienna OPMET Switch

AFS – Aeronautical Fixed Service

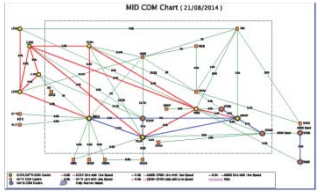
- OPMET Data exchange via
  - AFTN/CIDIN
  - AMHS

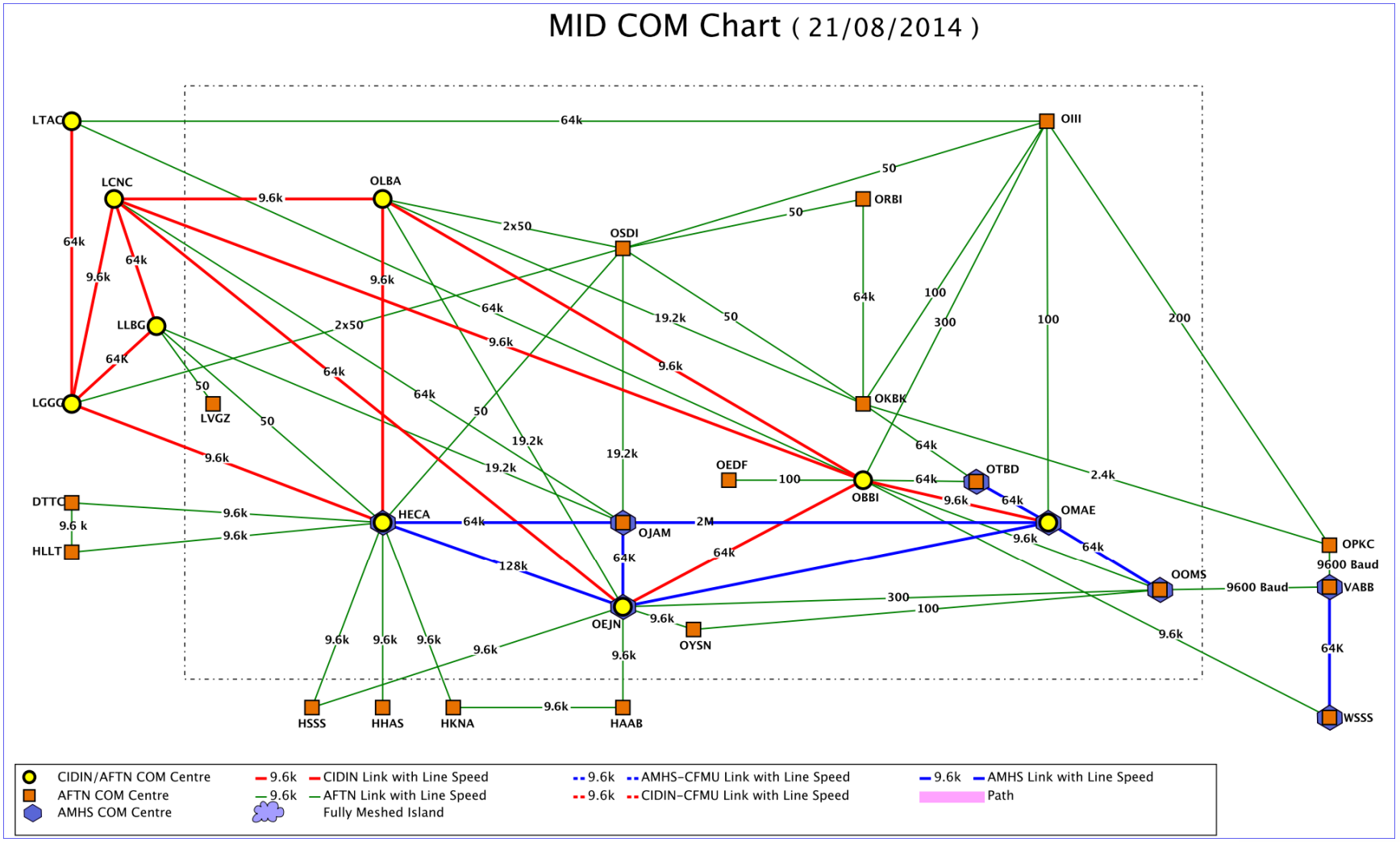
COM Chart – EUR Region



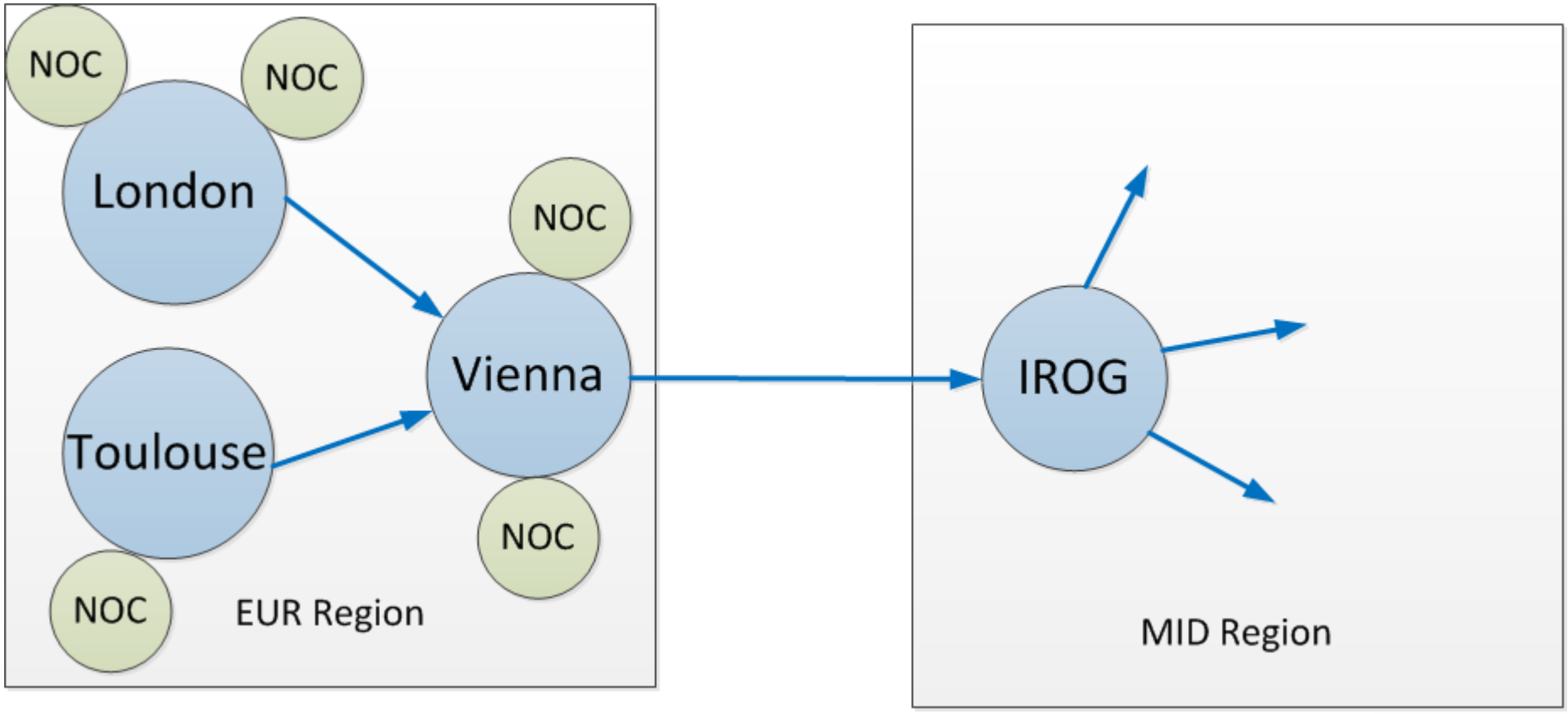


COM Chart – MID Region





EUR Data Distribution to MID

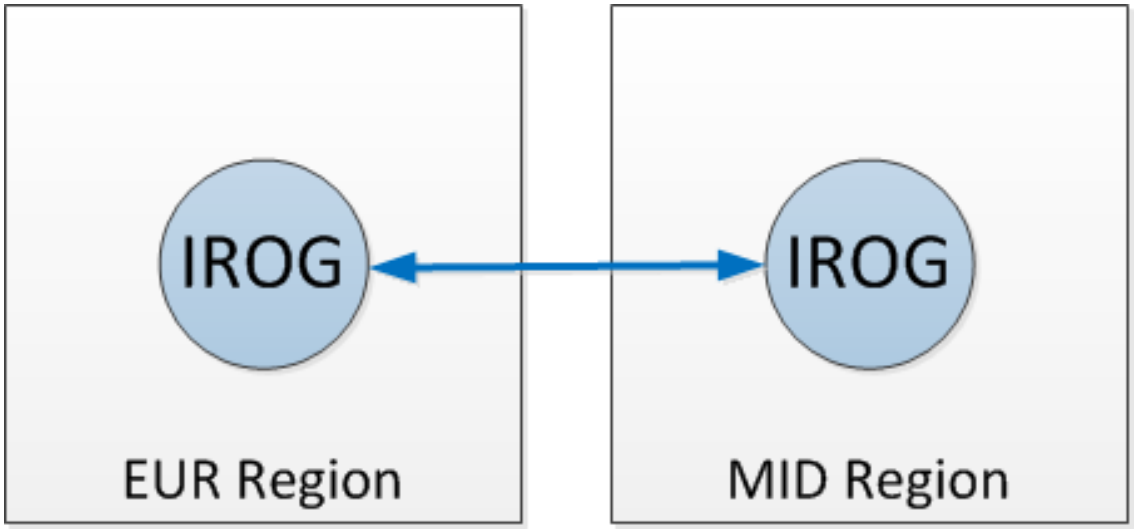


MID - EUR OPMET Data Exchange

- Exchange OPMET via IROG (Inter Regional Gateway) only

- EUR IROG is Vienna
- MID IROG is <to be defined>

- MID OPMET Data to be submitted to LOZZMMID
- EUR OPMET Data to be submitted to <to be defined>



EUR – MID AFS Connectivity

- LCNC-OBBI 9.6k
- LCNC-OEJN 64k
- LCNC-OJAM 64k
- LCNC-OLBA 9.6k

- LGGG-HECA 9.6K
- LGGG-OSDI 2x50baud

- LLBG-HECA 50baud
- LLBG-OJAM 19.2k

- LTAC-OIII 64k
- LTAC-OBBI 64k

- 300 kbit/s Bandwidth

Drawbacks:

- high dependency on LCNC
- no AMHS connection
- LTAC is no official Gateway in EUR

MID - EUR AFS Routing

- Route from OEJN to LOOO

main	**OEJN** ← 64k→ **LCNC** ←9.6k→ **LOOO**
alternate	**OEJN** ←128k→ **HECA** ←9.6k→ **LGGG** ←9.6k→ **LOOO**

- Route from OBBI to LOOO

main	**OBBI** ←64k→ **LCNC** ← 9.6k→ **LOOO**
alternate A	**OBBI** ←64k→ **OEJN** ←128k→ **HECA** ←9.6k→ **LGGG** ←9.6k→ **LOOO**
alternate B	**OBBI** ←64k→ **LTAC** ←64k→ **LGGG** ←9.6k→ **LOOO**
alternate C	**OBBI** ←64k→ **LTAC** ←64k→ **LIII** ←9.6k→ **LOOO**

MID EUR AFS Routing - Recommendations

- review alternate paths between MID and EUR Regions
- upgrade/avoid low speed lines
- establish AMHS connectivity

MID OPMET Traffic to EUR

- MID OPMET Data (FASID Table MET 2A)
  - 83 Locations METAR → 2000 METAR / day
  - 87 Locations TAF → 350 TAF / day

  - estimated AFTN average data rate required: 0.16 kbit/s
  - estimated AFTN peak data rate required: 2 kbit/s

    (peak rate = 1 hour traffic volume transmitted in 5 minutes)

EUR OPMET Traffic to MID

- EUR OPMET Data (FASID Table MET 2A)
  - 837 Locations METAR → 40,000 METAR / day
  - 824 Locations TAF → 3,500 TAF / day

  - estimated AFTN average data rate required: 0.74 kbit/s
  - estimated AFTN peak data rate required: 8.8 kbit/s

AFTN vs. AMHS

- AMHS X.400 protocol overhead

  AMHS traffic volume = number of AFTN msg * (AFTN msg size + 800 characters)

  number of AFTN msg: 20,000
  AFTN msg size: 400

  AMHS traffic volume = 20,000 * (400 + 800) = 24,000 kByte / day
  AFTN traffic volume = 20,000 * 400 = 8,000 kByte / day

  AFTN data rate = 0.74 kbit/s with peak 8.8 kbit/s
  AMHS data rate = 2.2 kbit/s with peak 26.6 kbit/s

TAC vs. AvXML

- if uncompressed
  - AvXML data volume = TAC * 80
- if compressed
  - AvXML data volume = TAC * 25
- AMHS data rate = 55 kbit/s with peak 660 kbit/s

Vienna OPMET Switch

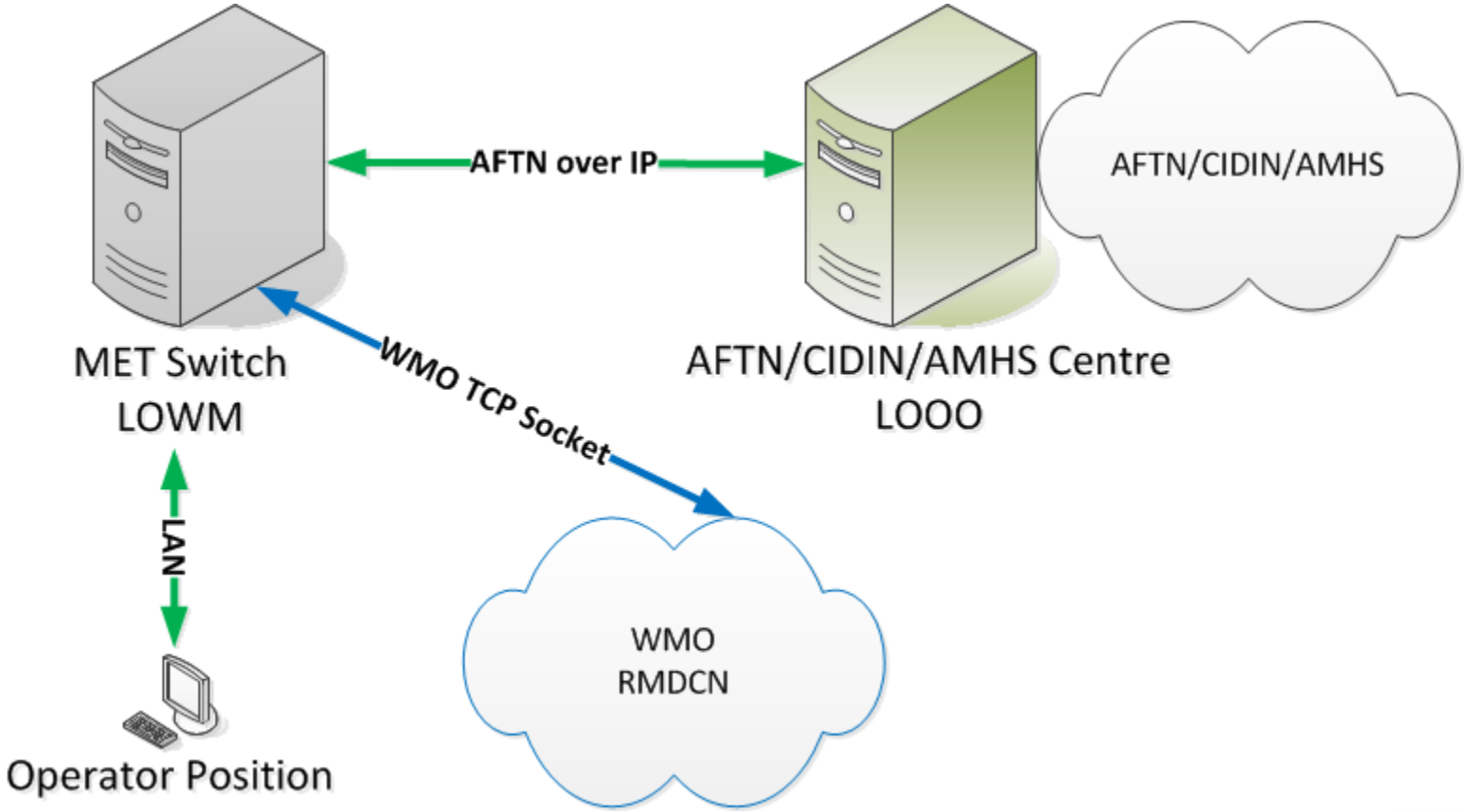
- 2x HP ProLiant G6
- Storage MSA2000, 4x 146 GigaByte disks

- Interfaces
  - AFTN over IP
  - WMO TCP Socket
  - async V.24

- Oracle Database
  - compilation of bulletins
  - reply to RQM/ requests

- Max message throughput (measured)
  - 20 messages / second

Vienna OPMET Switch



Vienna OPMET Switch

- Traffic AFTN
  - 40,000 messages in
  - 130,000 messages out
- Traffic WMO
  - 150,000 messages in
  - 1.200,000 messages out
- Database requests
  - 1000 per day
- Messages rejected to Operator
  - 300 per day

Summary

- current AFTN/CIDIN performance sufficient for MID-EUR exchange
- define MID IROG(s) and AFTN address(es)
- alternate routes to be reviewed
- AMHS connectivity and higher bandwidth for AvXML