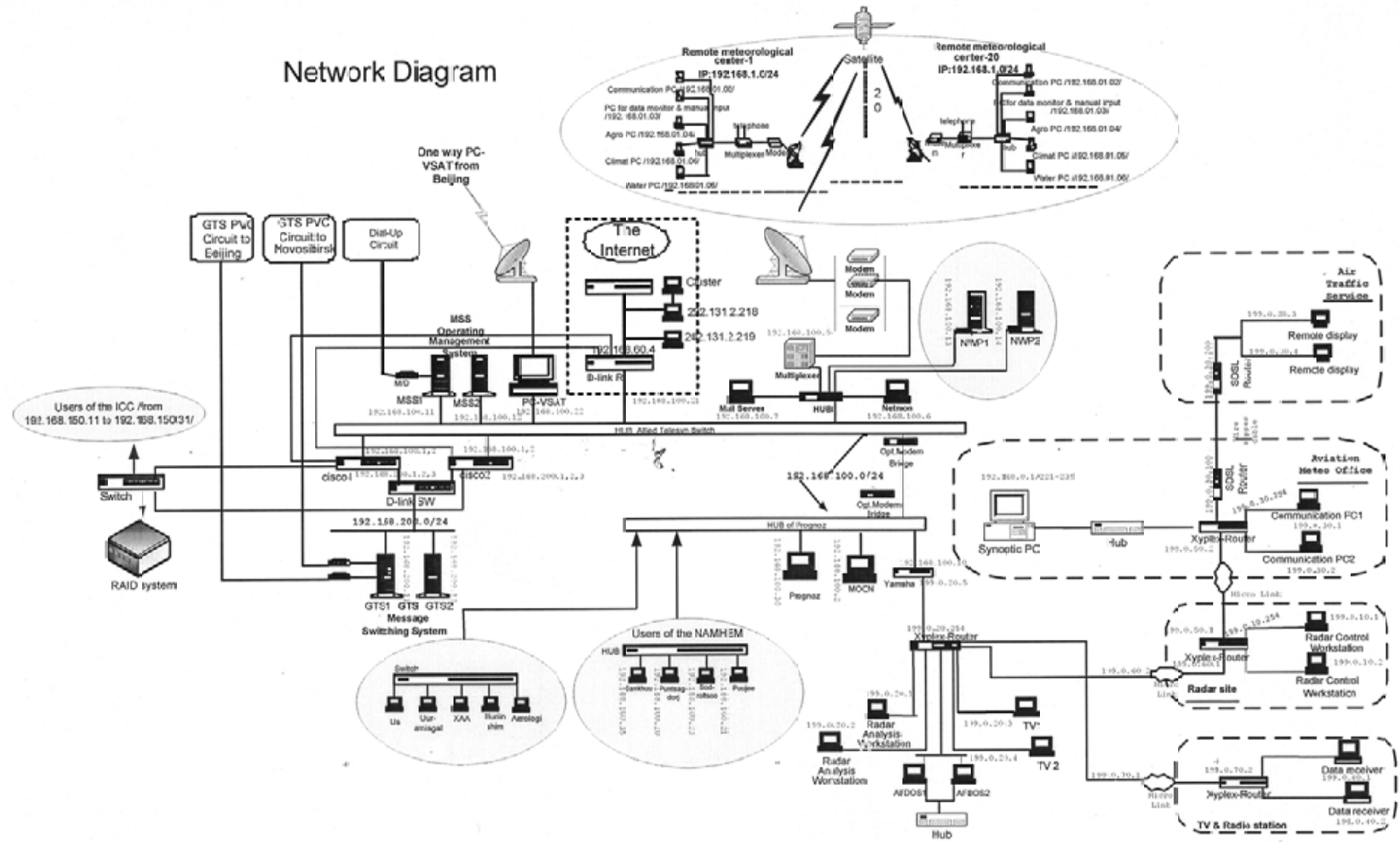


Annex 8 Computer Networking

- Overall plan of computer network in NAMHEM
- The problems and the future expansion plan of the NAMHEM network

Network Diagram

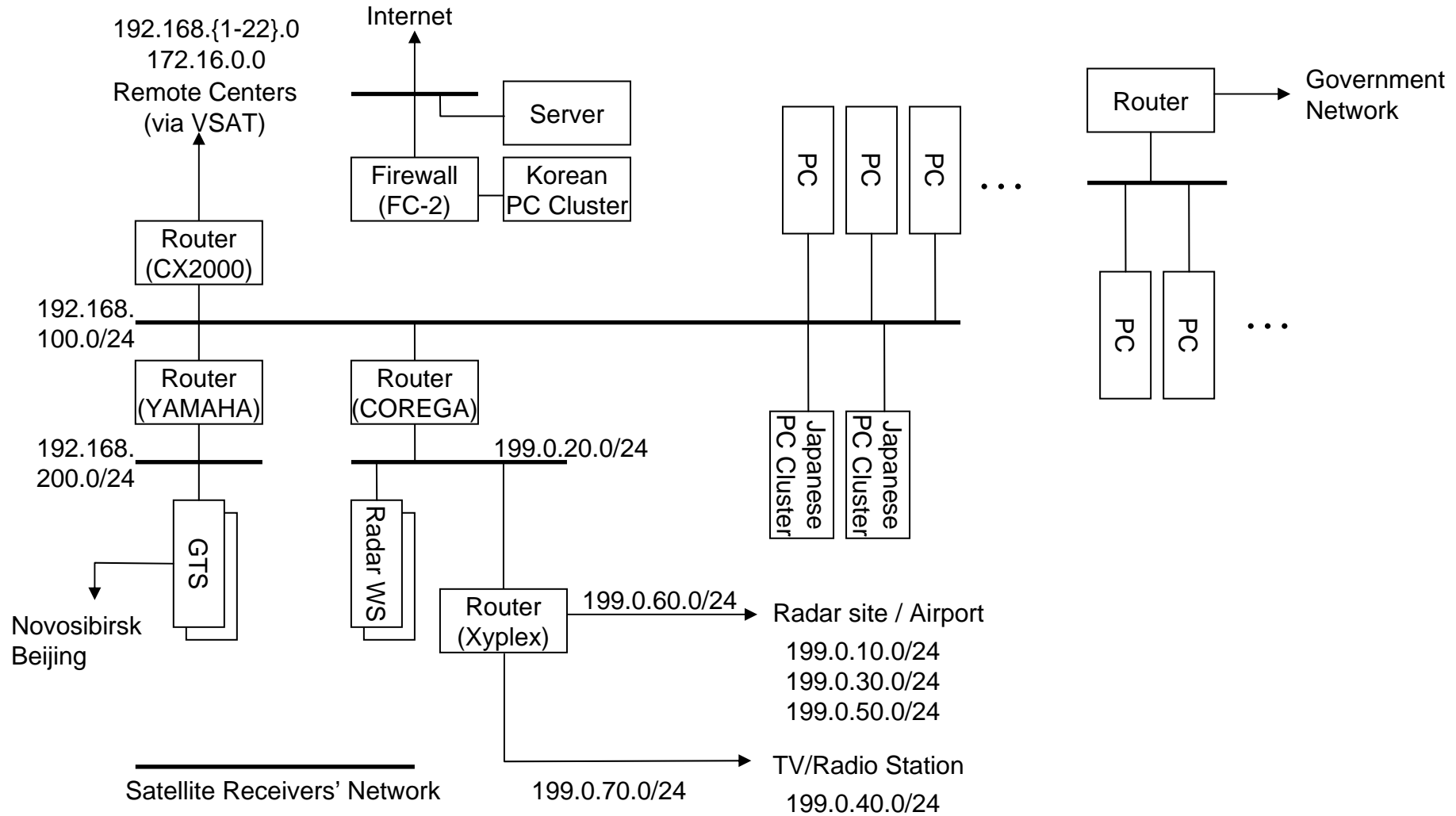


200.1
 200.2
 200.3
 200.24

The problems and the future
expansion plan of
the NAMHEM network

May 25, 2005

NAMHEM Network Topology (Current Configuration)



NAMHEM Network Issue

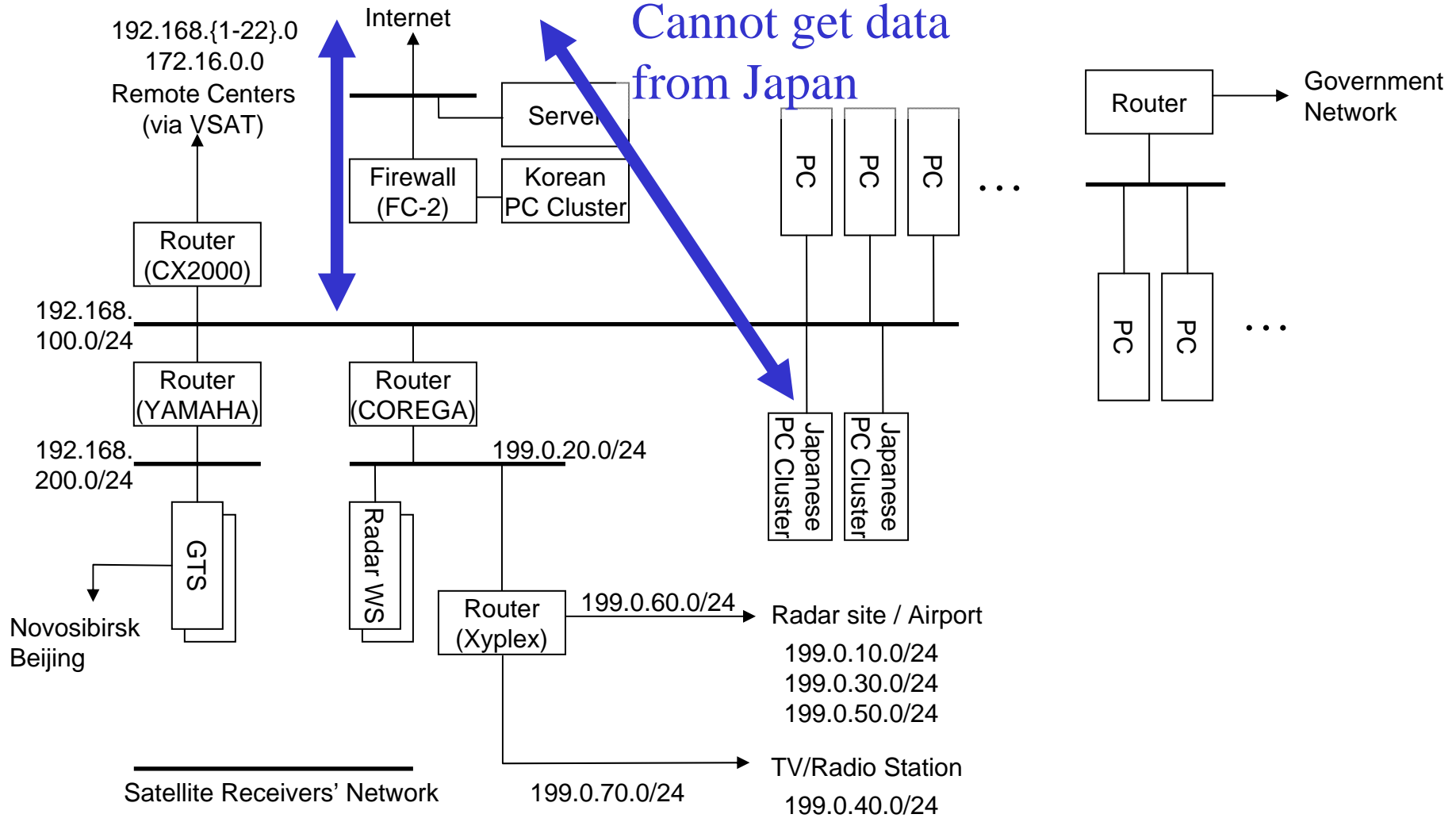
1. Internet connection
2. IP masquerade (radar, airport)
3. Connectivity (airport)
4. Isolated networks
5. Complicated routes

No Internet
Connection!!

NAMHEM Network Issue

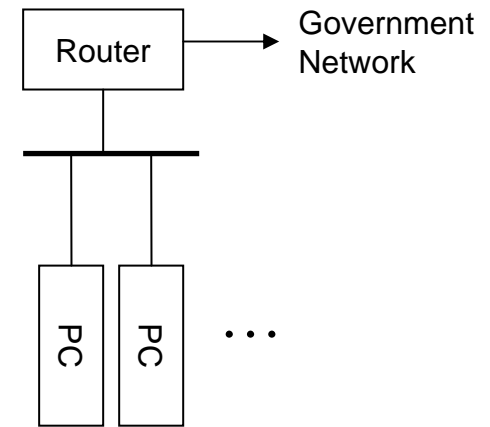
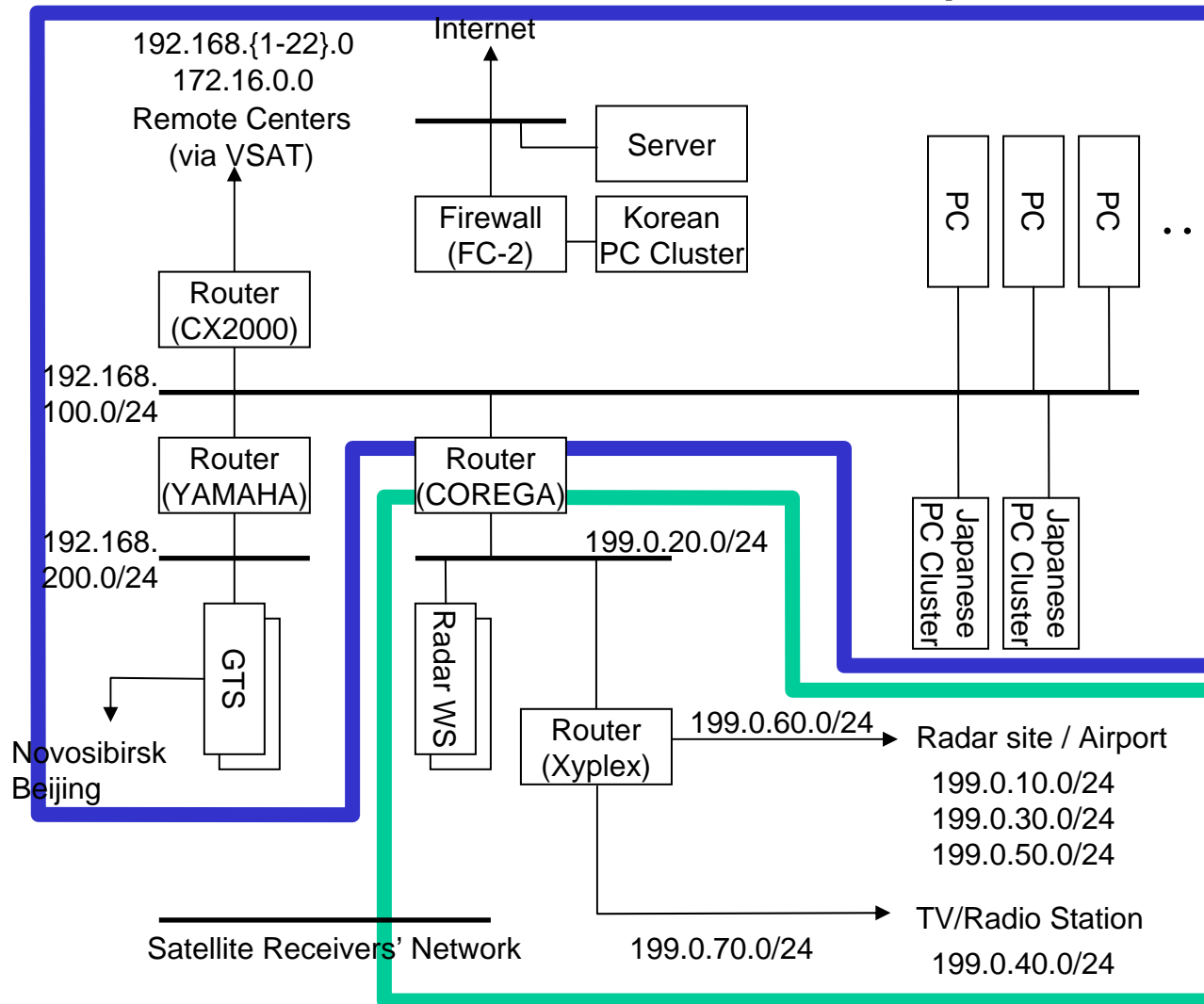
1. Internet connection

Cannot get data
from Japan



NAMHEM Network Issue

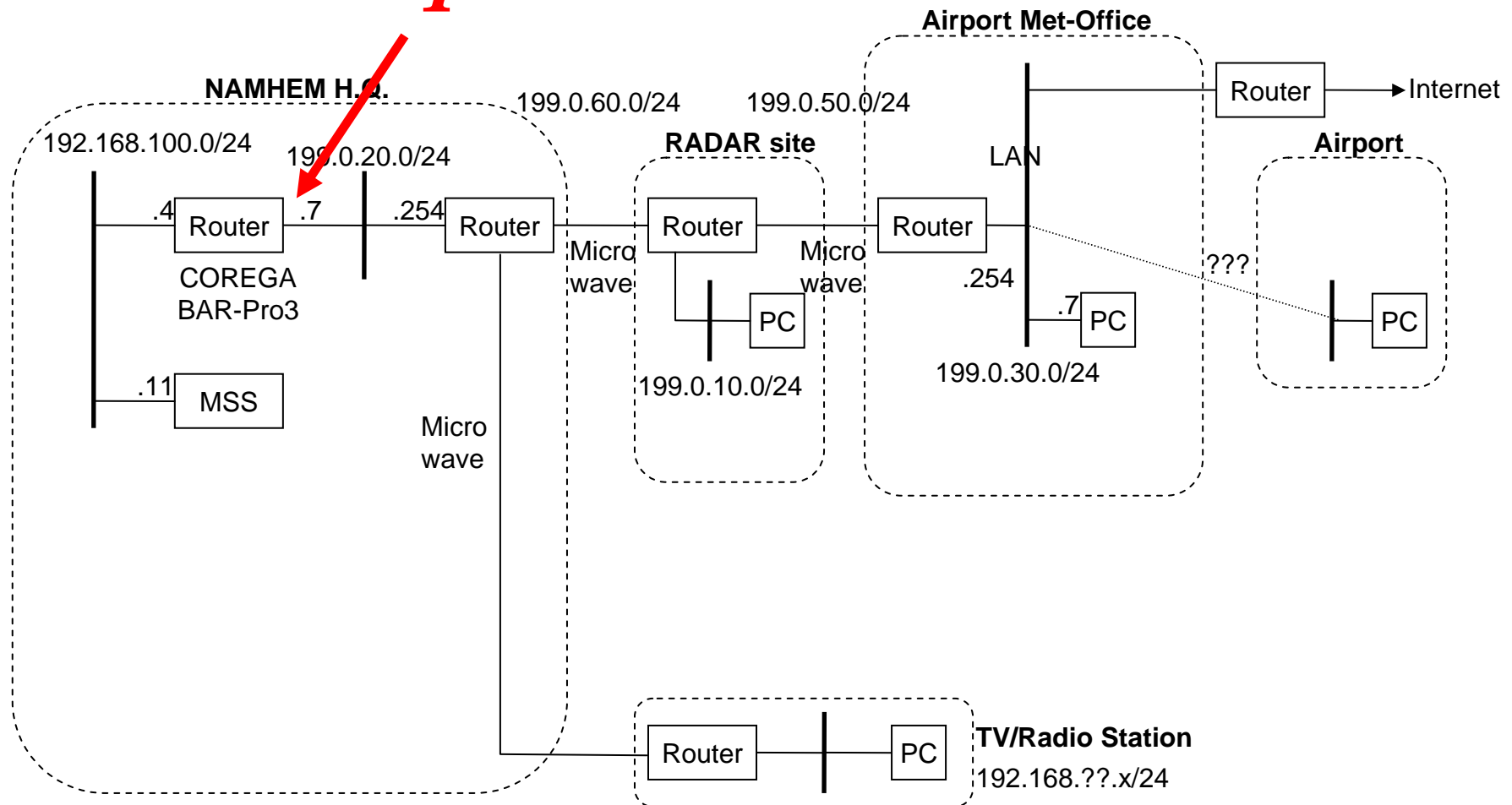
2. IP masquerade



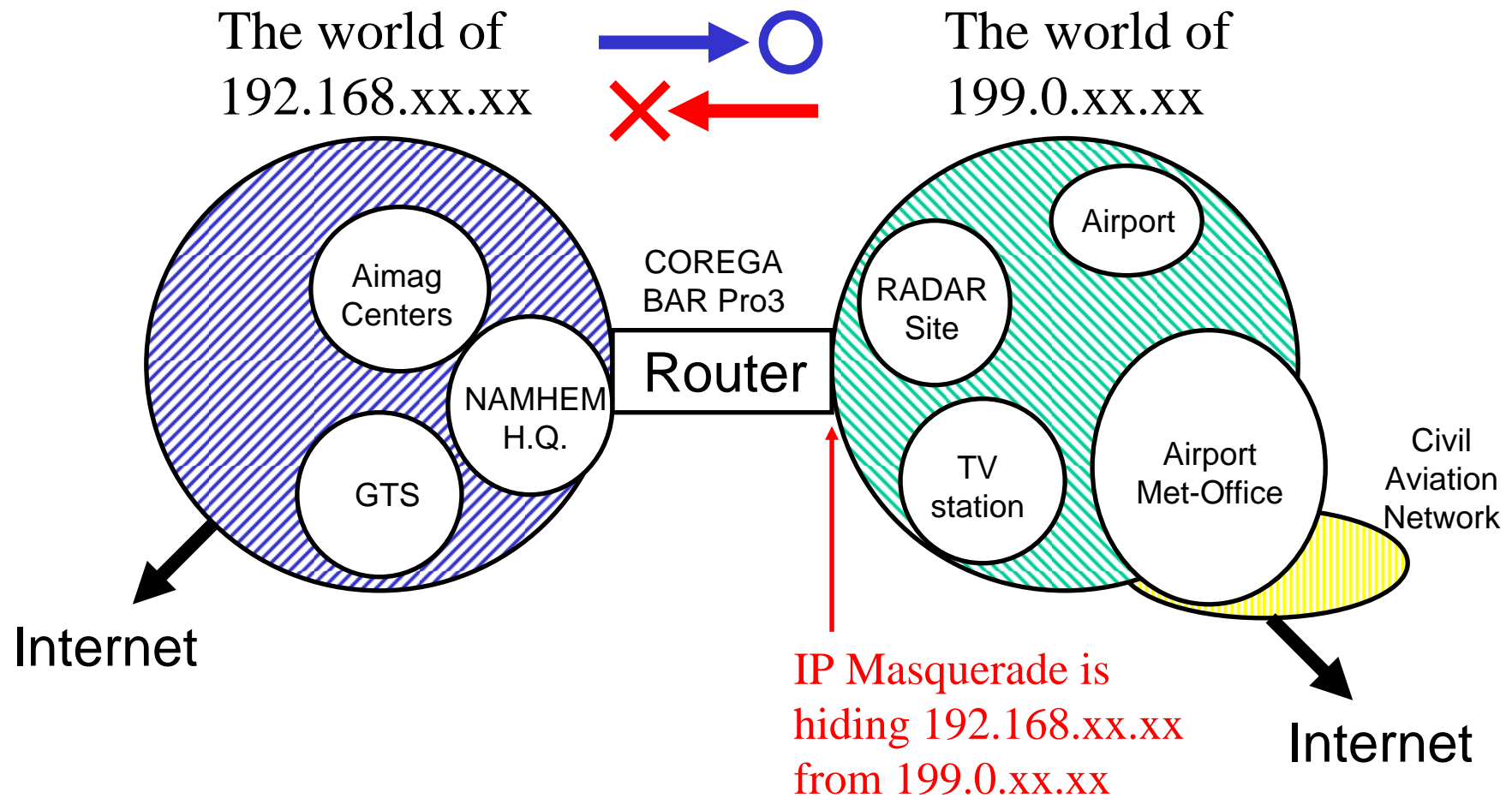
Divided into two worlds

NAMHEM H.Q. and Airport Connection

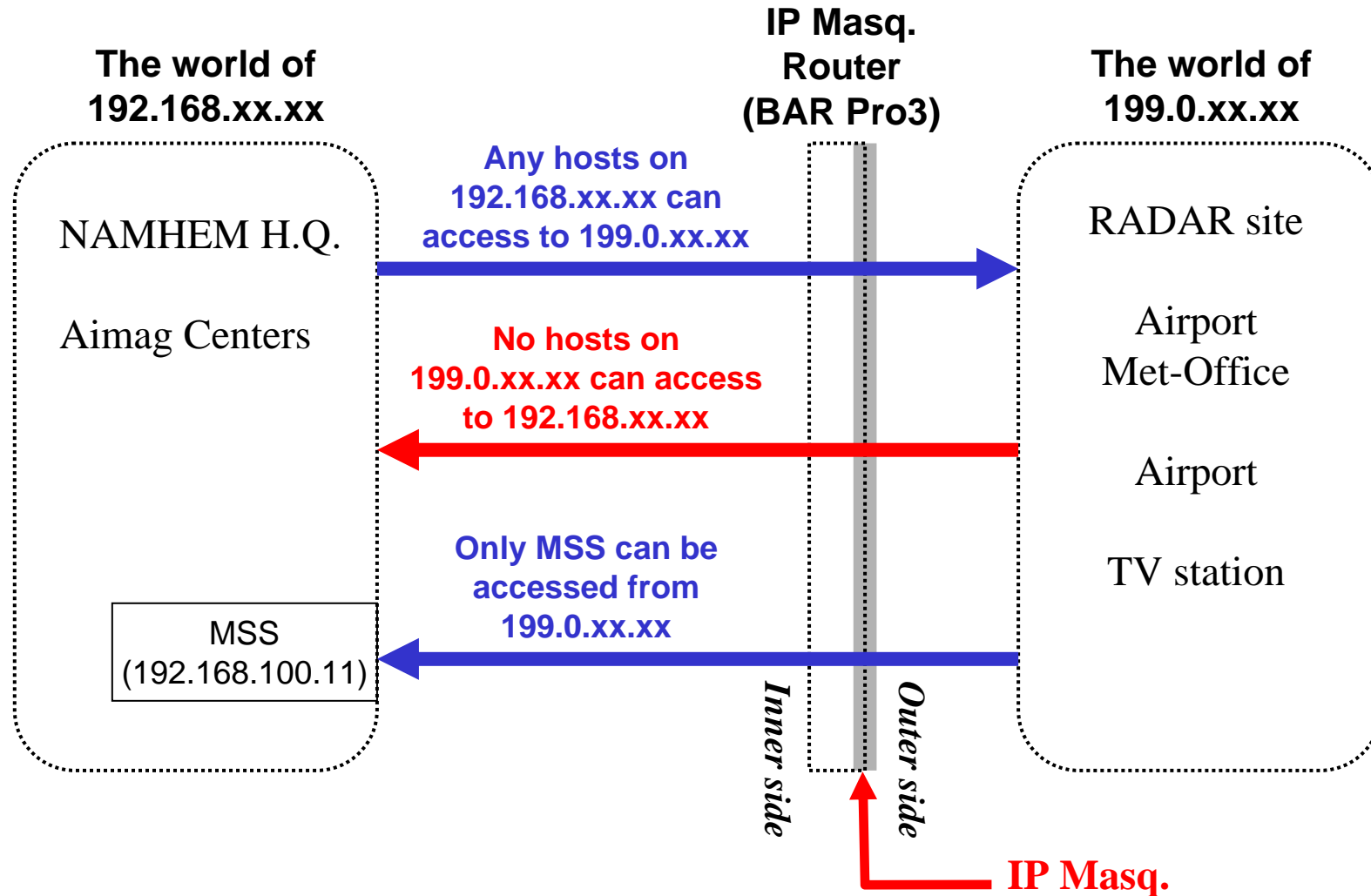
IP masquerade!!



The Network is Divided into Two Worlds by IP Masquerade



Connectivity Between the Two Worlds



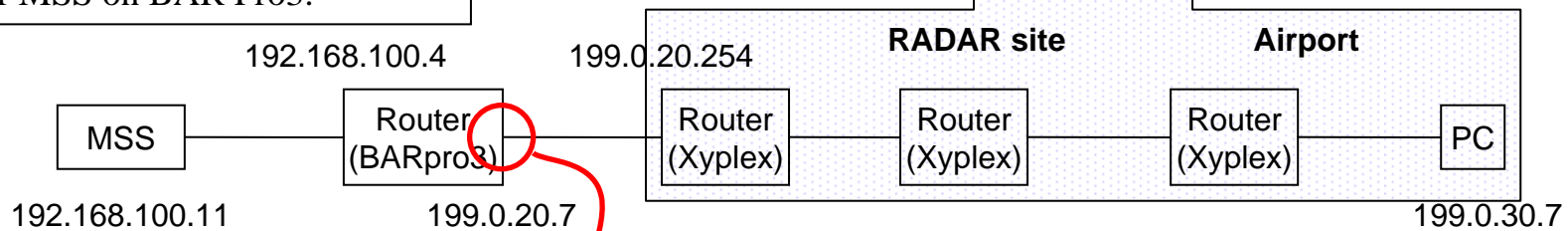
Route Information of the Routers

192.168.100.4	Direct(LAN)
199.0.20.254	Direct (WAN)
Default	199.0.20.254

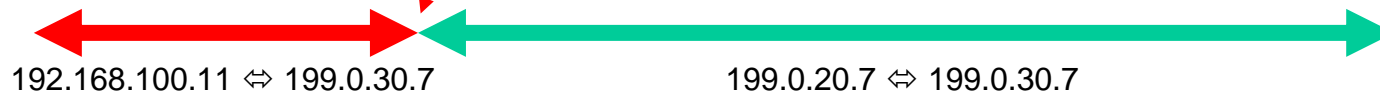
199.0.10.0/24	199.0.50.0/24
199.0.20.0/24	199.0.60.0/24
199.0.30.0/24	199.0.70.0/24
199.0.40.0/24	

*No route to
192.168.0.100/24
etc.*

There is a special configuration for MSS on BAR Pro3.

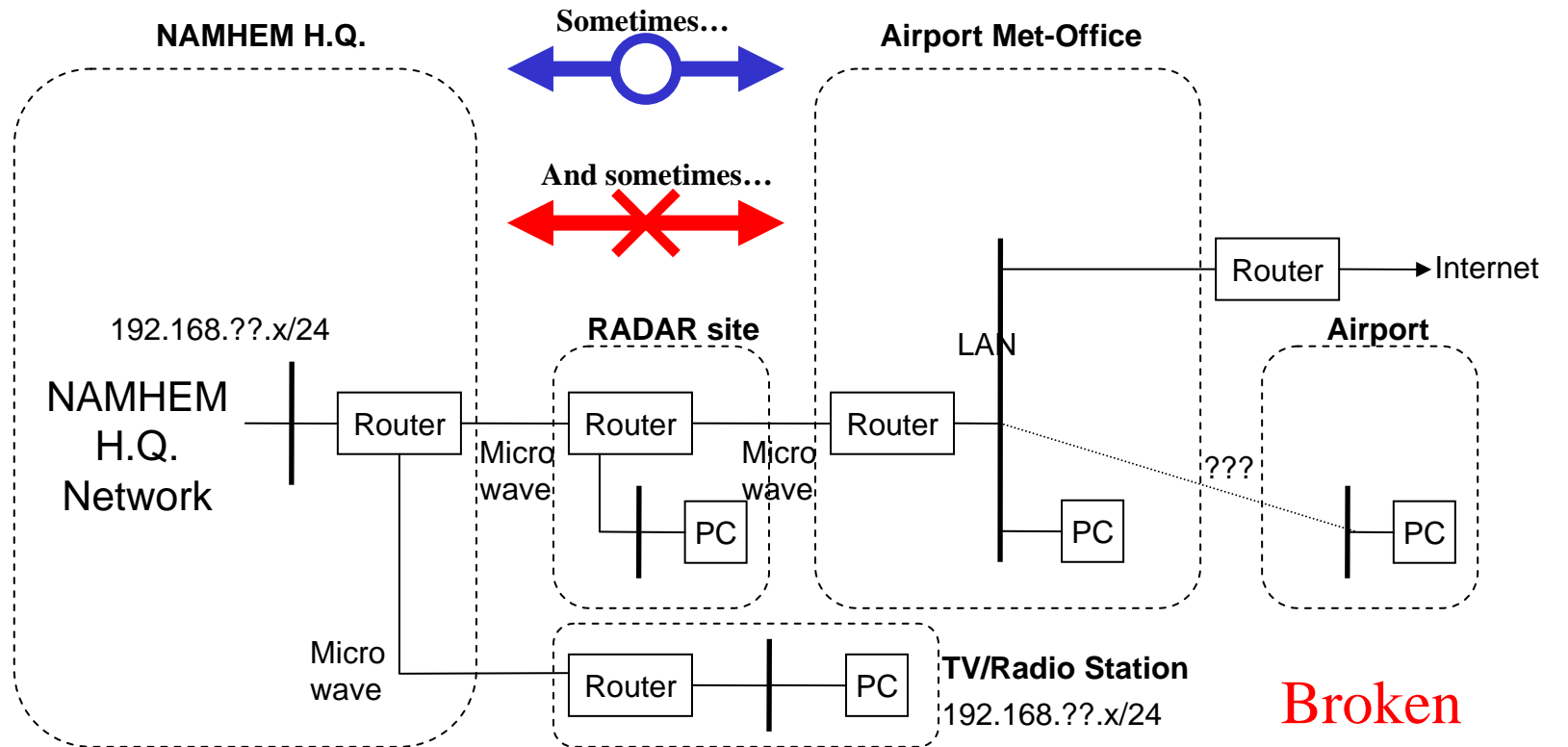


*IP Masquerade
(Any ⇔ 199.0.20.7)
With static NAT
192.168.100.11 ⇔ 199.0.20.7*



NAMHEM Network Issue

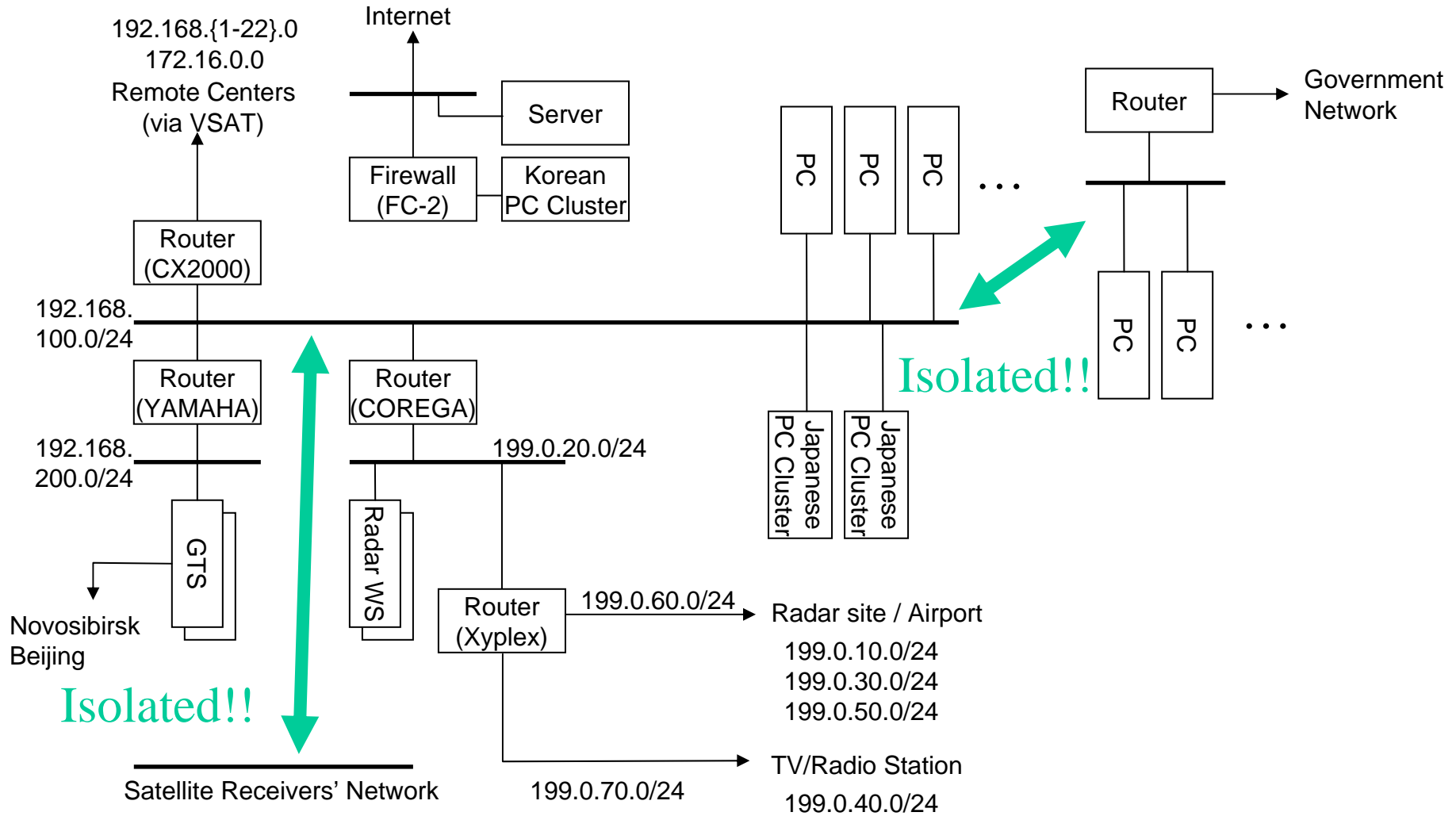
3. Connectivity Problems (airport)



Broken equipments

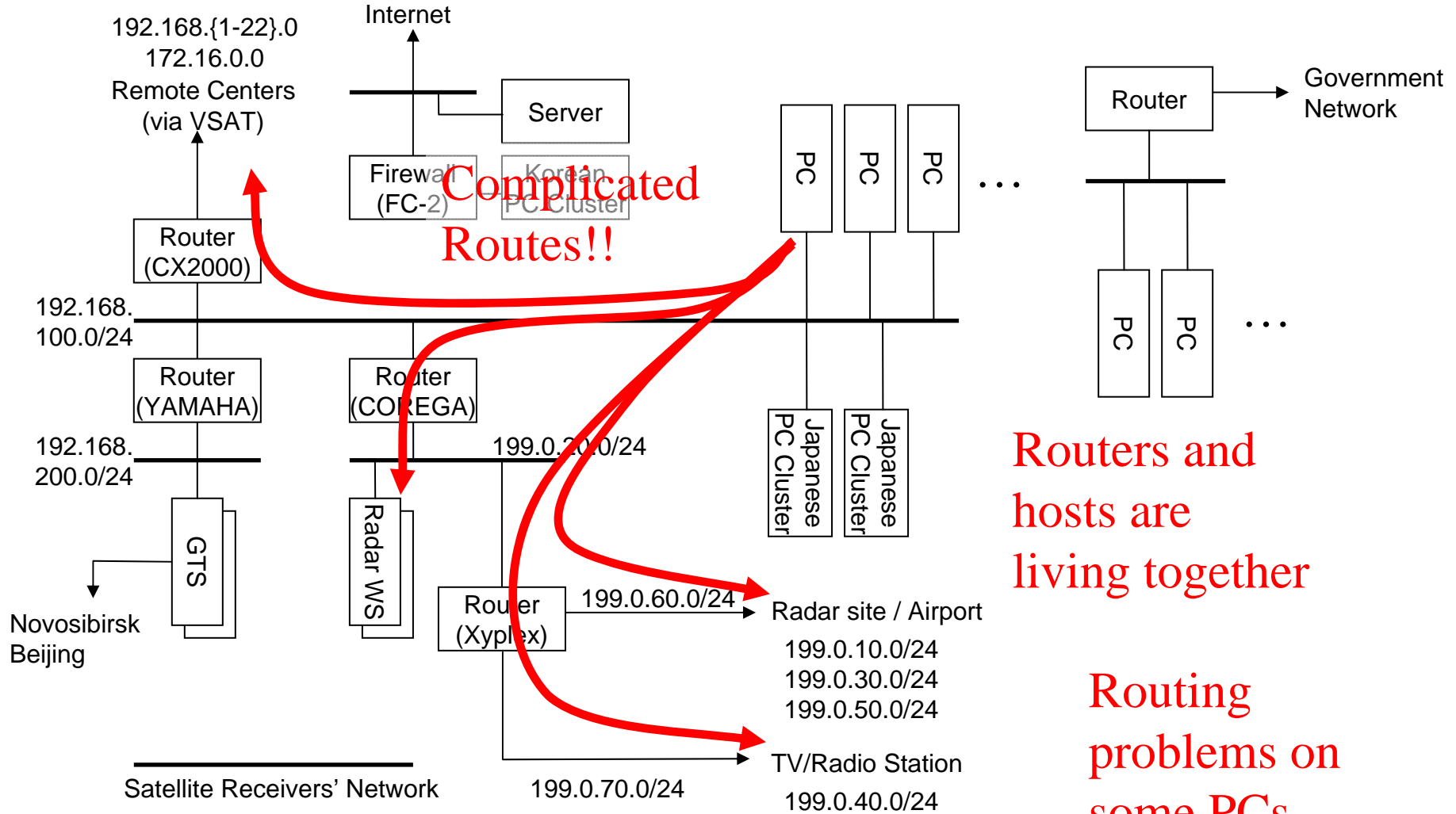
NAMHEM Network Issue

4. Isolated Networks



NAMHEM Network Issue

5. Complicated Routes

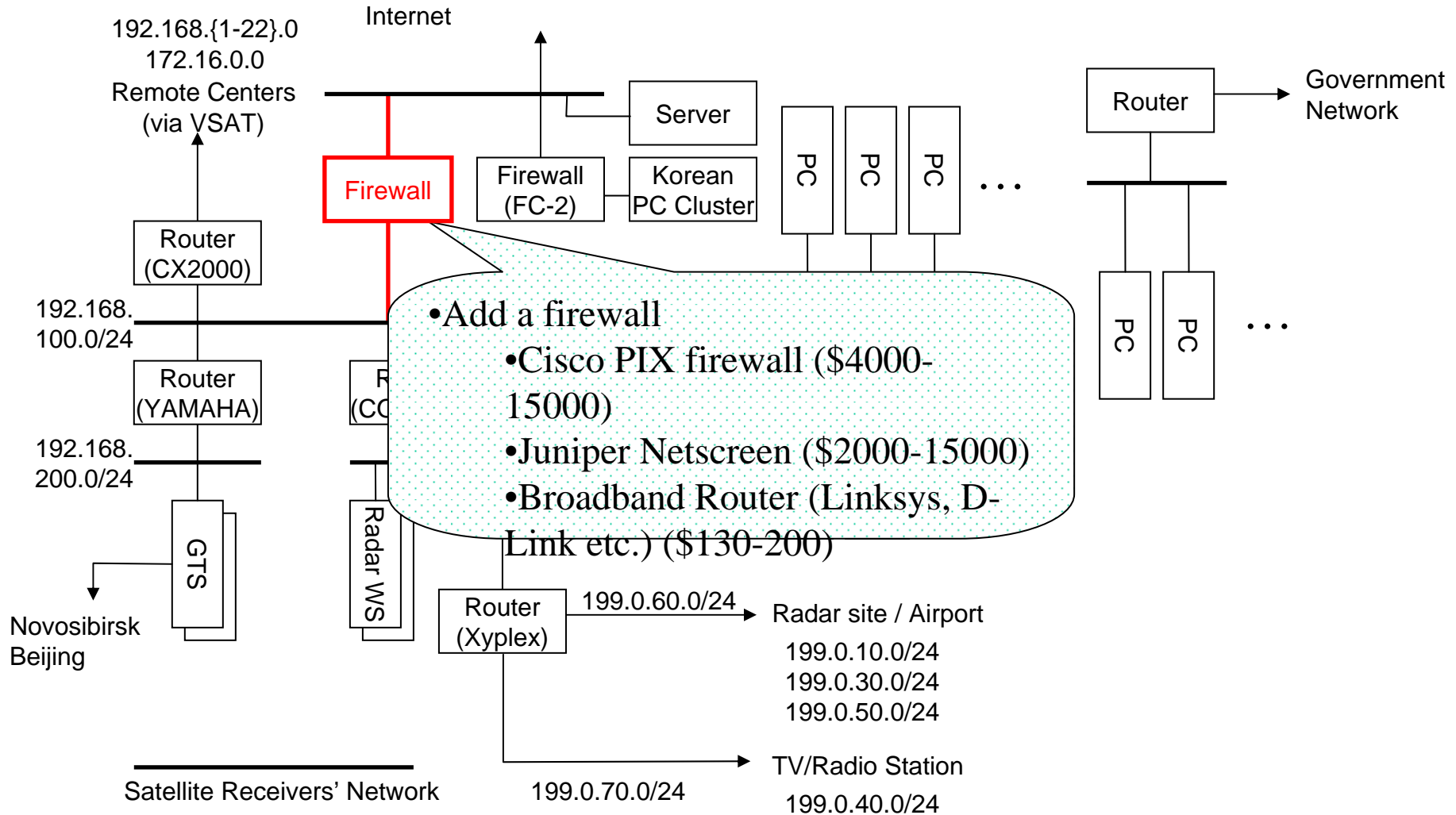


Complicated Routes!!

Routers and hosts are living together

Routing problems on some PCs

NAMHEM Network Upgrade Plan (Phase 1: Connecting to the Internet)



NAMHEM Network Upgrade Plan (Phase1: Connecting to the Internet)

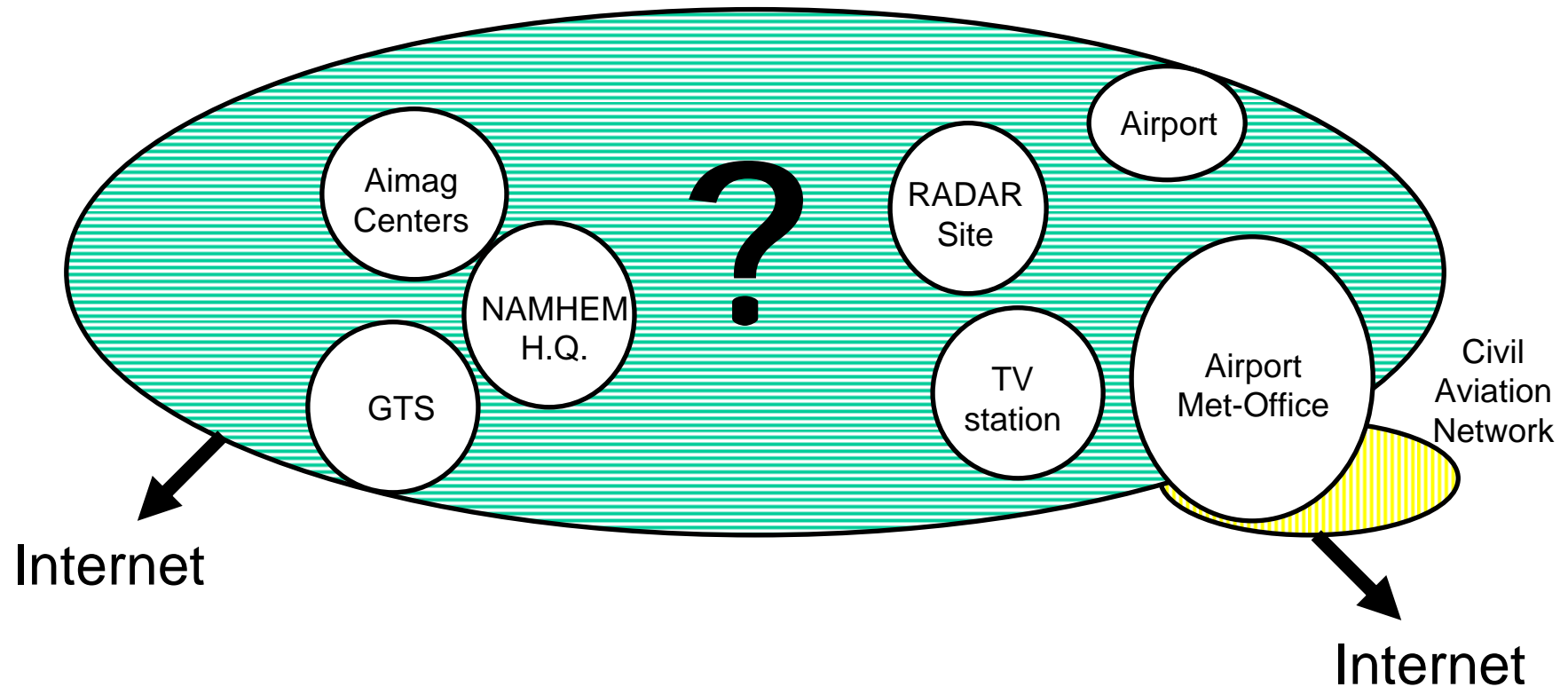
The key benefits of this plan

- Internet connectivity
 - PCs or workstations on 192.168.100.0/24 network (Incl. Japanese Cluster PCs) will be able to access to the Internet.
 - PCs on all aimag centers will be able to access to the Internet
 - Few configuration change on NAMHEM H.Q.
 - No configuration change on aimag centers.

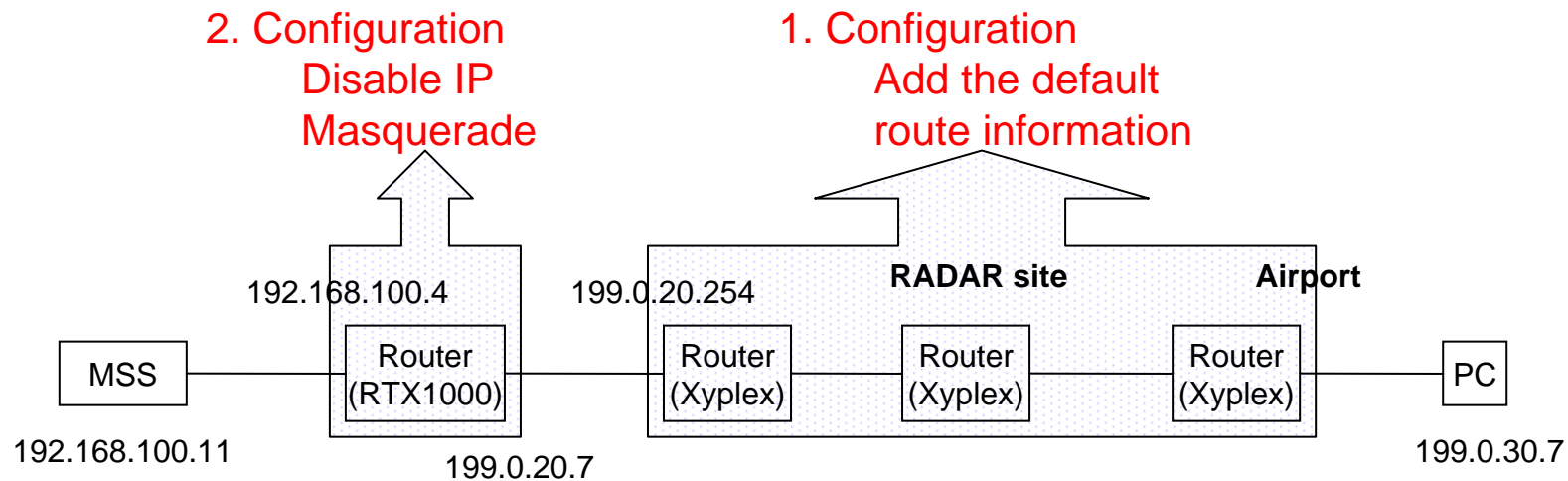
NAMHEM Network Upgrade Plan

Phase2: Unify the two worlds

How to Unify?



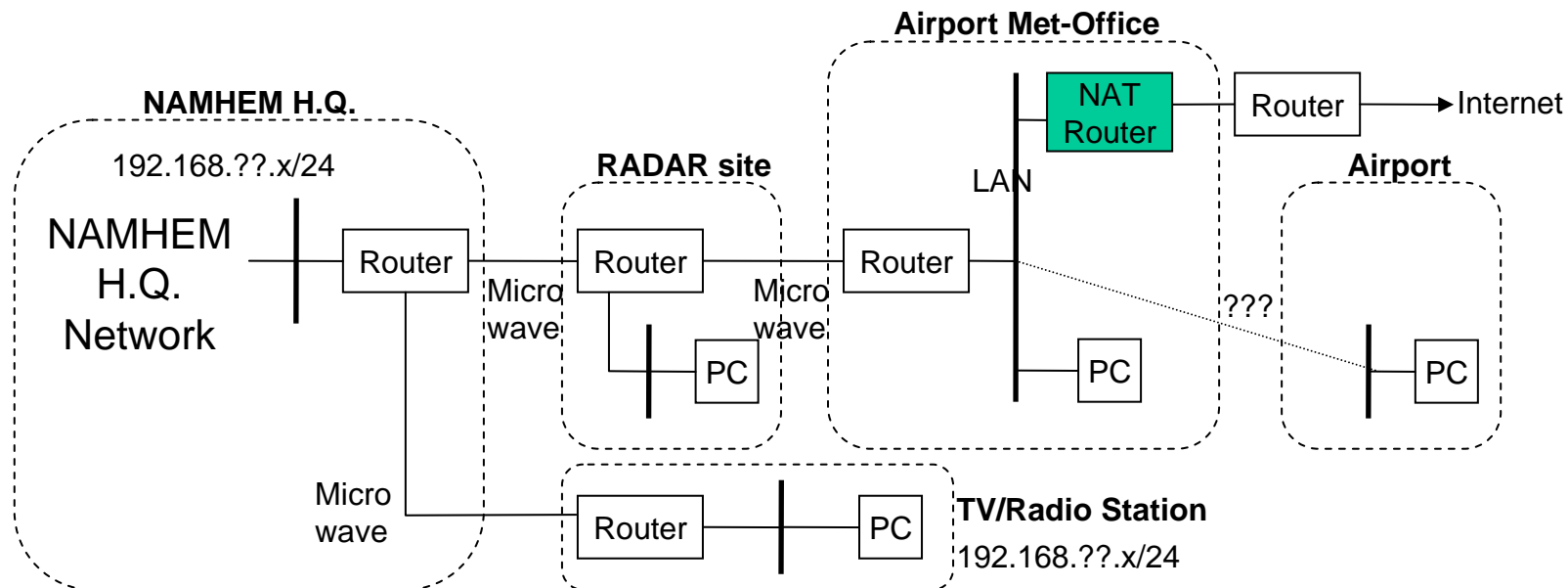
How to Unify: Quit using IP masquerade



The key benefits of this plan

- The PCs on airport / radar site will be able to access to the PCs on NAMHEM H.Q. / aimag centers.
- The PCs on airport have other issue.

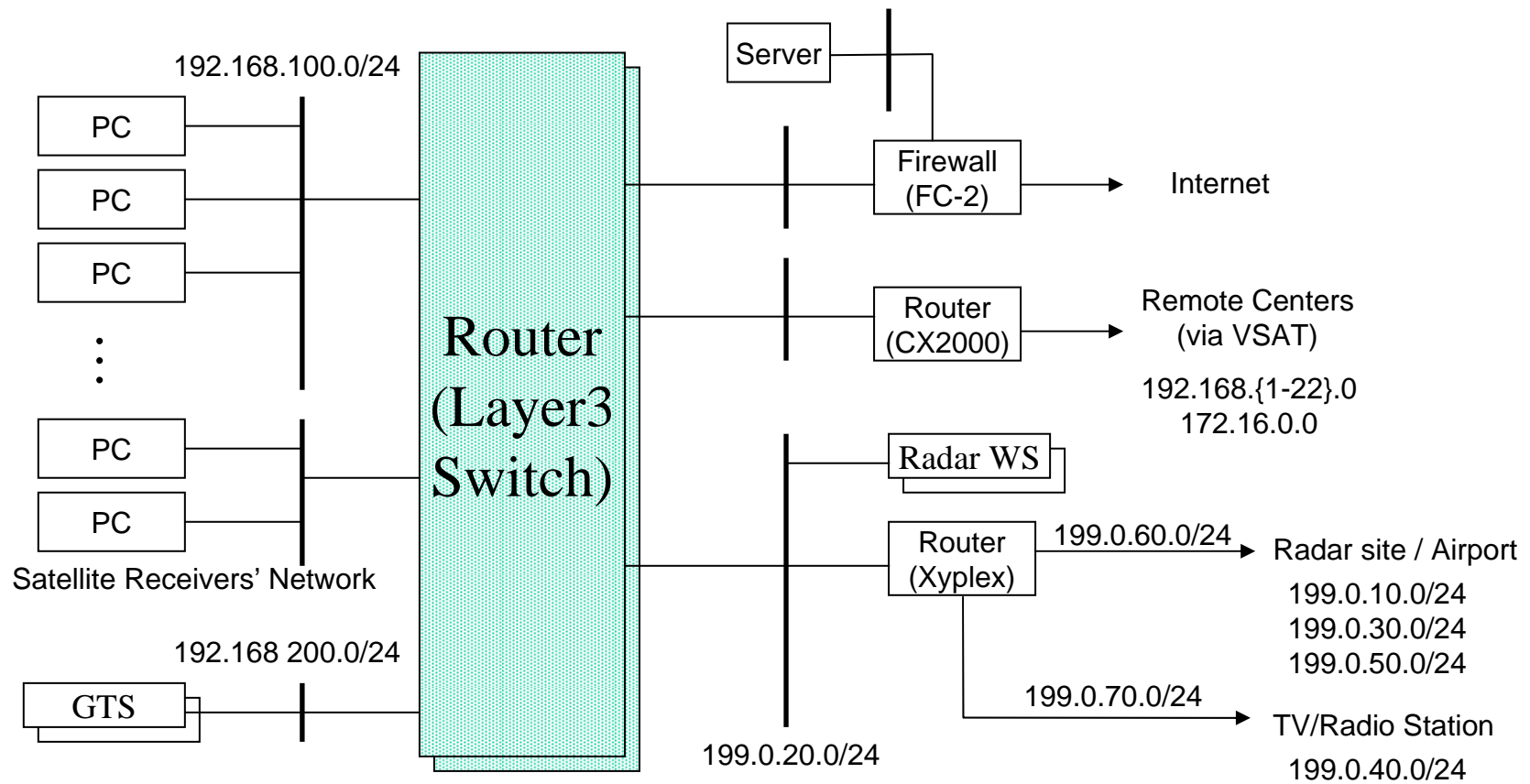
NAMHEM Network Upgrade Plan (Phase 3: Adding a NAT router to the Airport Met-Office network)



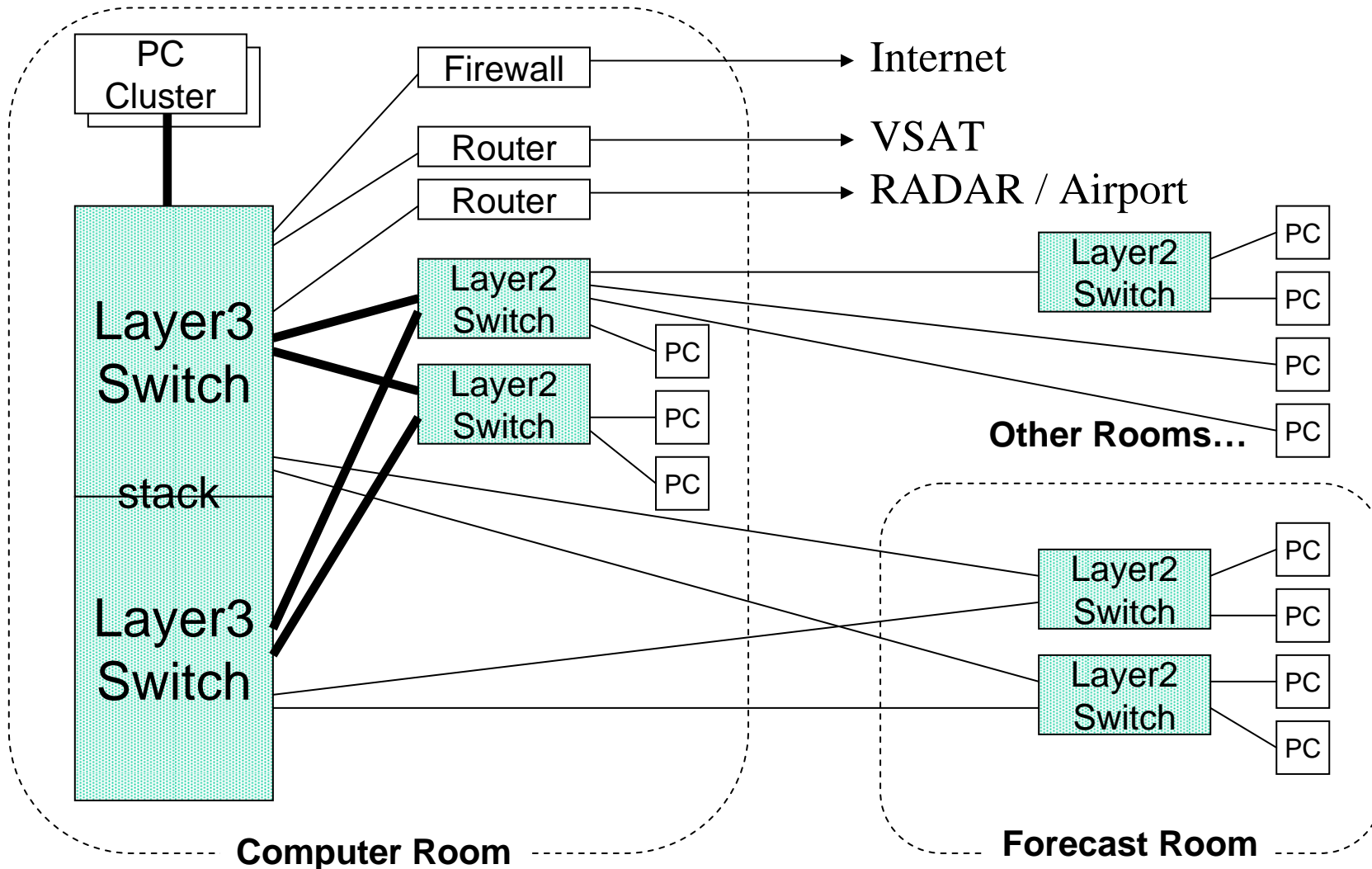
The key benefits of this plan

- Airport Met-Office PCs can access both NAMHEM network and the Internet.

NAMHEM Network Upgrade Plan (Phase 4: Integration of all LAN routers)



NAMHEM Network Upgrade Plan (Phase 4: Integration of all LAN routers) Hardware Configuration

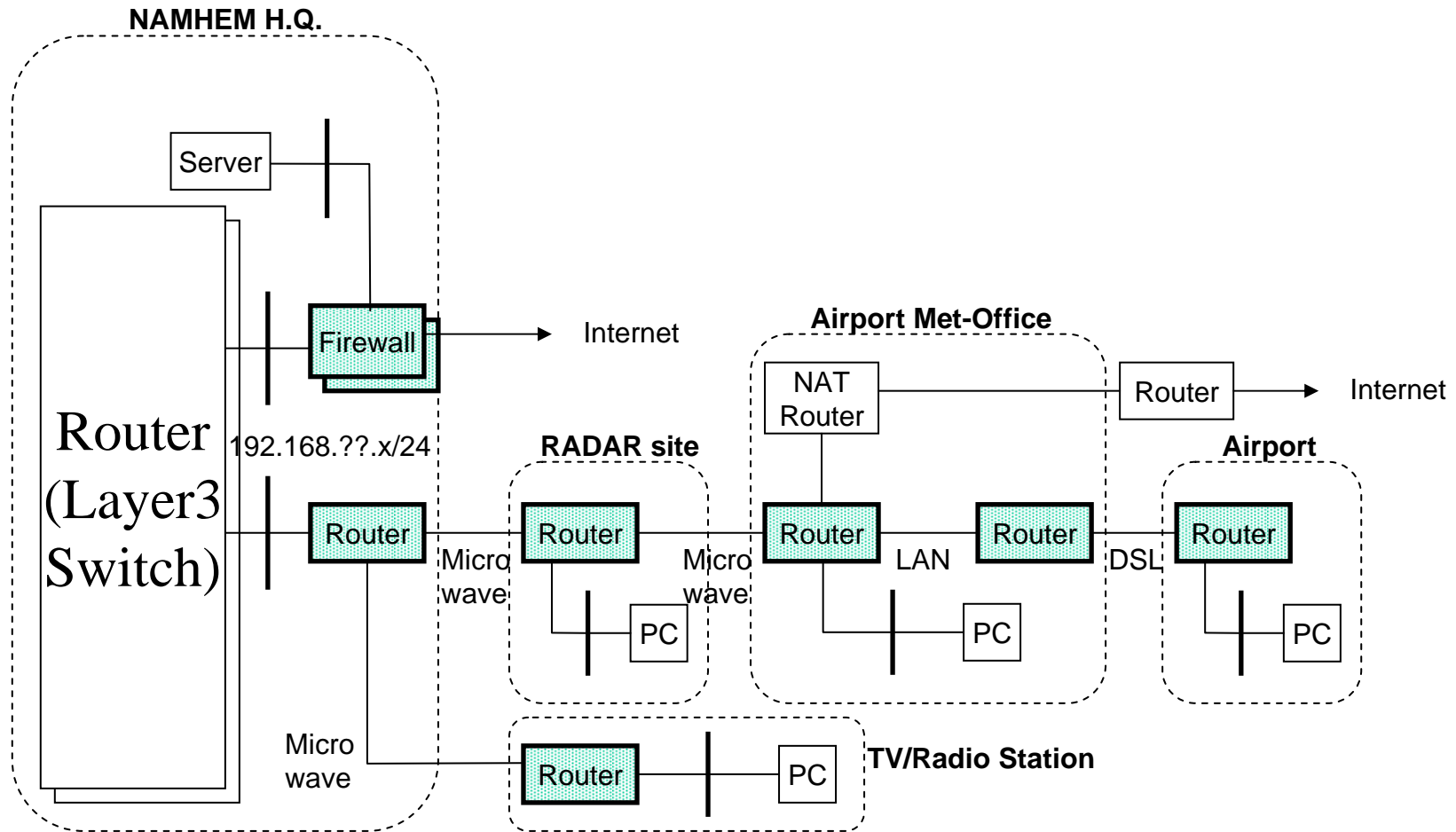


NAMHEM Network Upgrade Plan (Phase 4: Integration of all LAN routers)

The key benefits of this plan

- The isolated networks will be connected
- No complicated setting will be required on PCs or WAN routers.
- Reliable (Redundant)
- Almost all LAN configuration will be integrated to one equipment
- Flexible network design
- High Performance
 - Gigabit Ethernet capability
 - Much faster than traditional routers

NAMHEM Network Upgrade Plan (Phase 5: Replacement of WAN equipments)

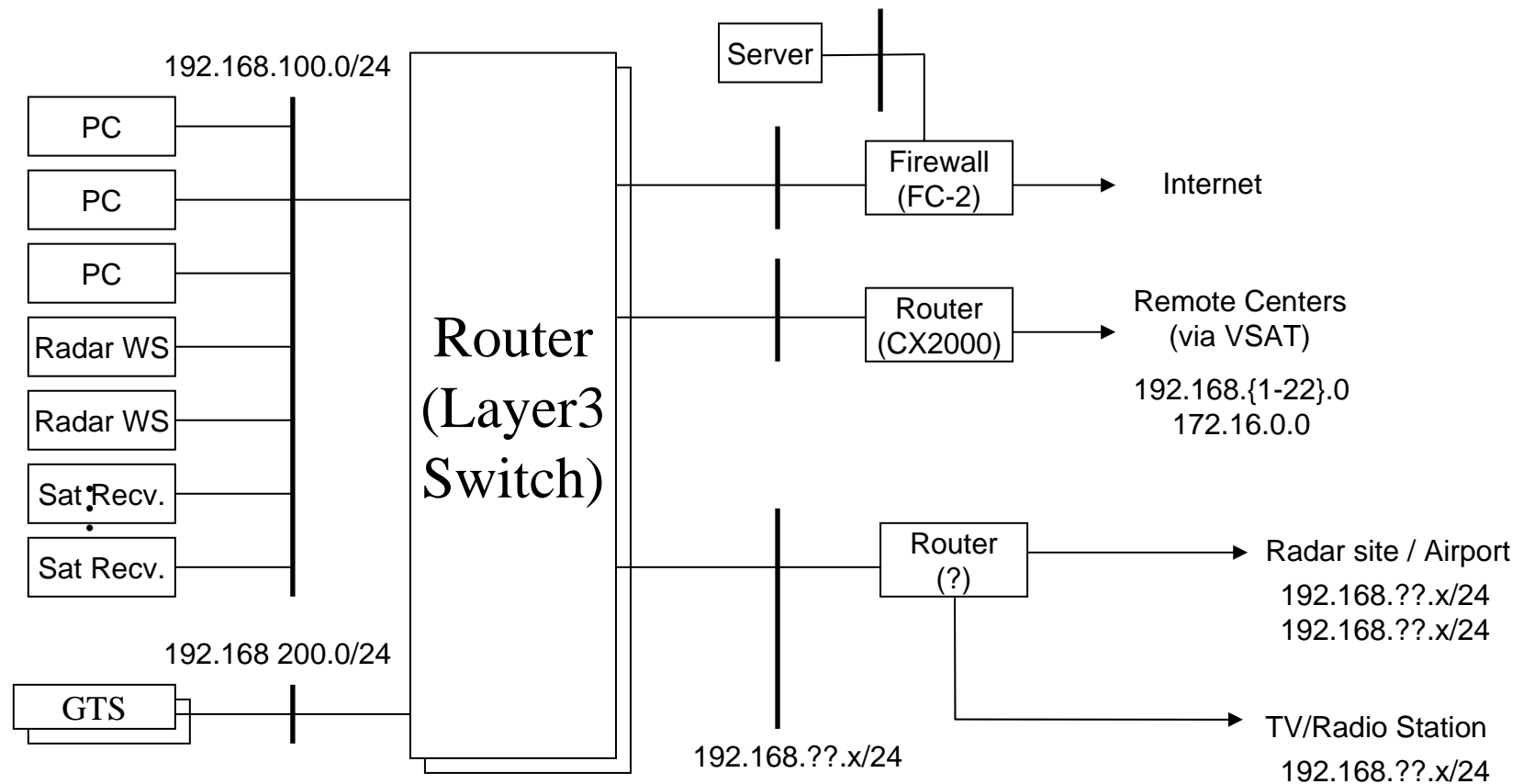


NAMHEM Network Upgrade Plan (Phase 5: Replacement of WAN equipments)

The key benefits of this plan

- Reliable firewalls
 - Without hard disks
- The configuration of PCs at the airport met-office will be simple (without many route settings).
- Replacement of the old microwave routers
- Replacement of the broken DSL routers

NAMHEM Network Upgrade Plan (Phase 6: Migration from illegal global addresses to private addresses)



NAMHEM Network Upgrade Plan (Phase 6: Migration from illegal global addresses to private addresses)

The key benefits of this plan

- All addresses will be private addresses
 - Easy to connect all of the networks
 - No routing difficulties on use of Internet
- Simplified
 - Satellite data receiver network is integrated to 192.168.100.0/24
 - Radar workstations are integrated to 192.168.100.0/24

Annex 9 Dust and Sand Storm (DSS) Monitoring Network

- Equipment for Kosa Monitoring Network
- DSS monitoring data

Equipment for Kosa Monitoring Network



Zamin-ud Meteorological Station (Installation of Container Base)
11 August, 2007



Zamin-ud Meteorological Station (Equipment installed in the Container)
18 August, 2007

Equipment for Kosa Monitoring Network



Sain Shand Aimag Center (Assembling Container)
16 August, 2007



Completion of the Equipment Installation Work at Sain Shand Aimag Center
25 August, 2007

Equipment for Kosa Monitoring Network



Completion of the Equipment Installation Work at Dalanzadgad Aimag Center
4 September, 2007



Completion of the Equipment Installation Work at Dalanzadgad Aimag Center
4 September, 2007

Equipment for Kosa Monitoring Network

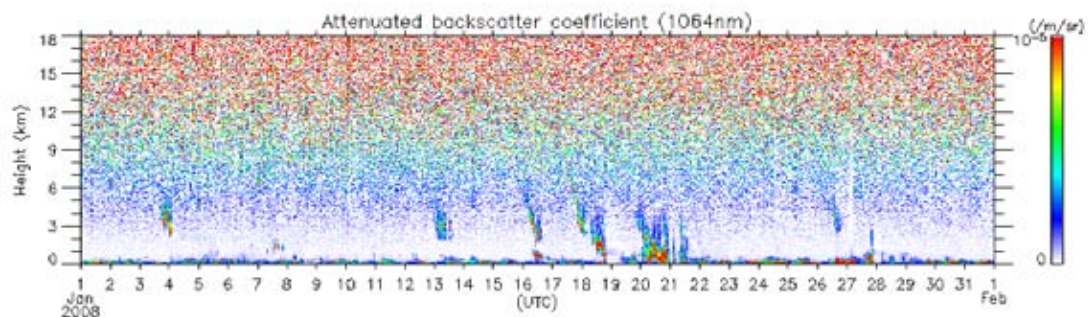
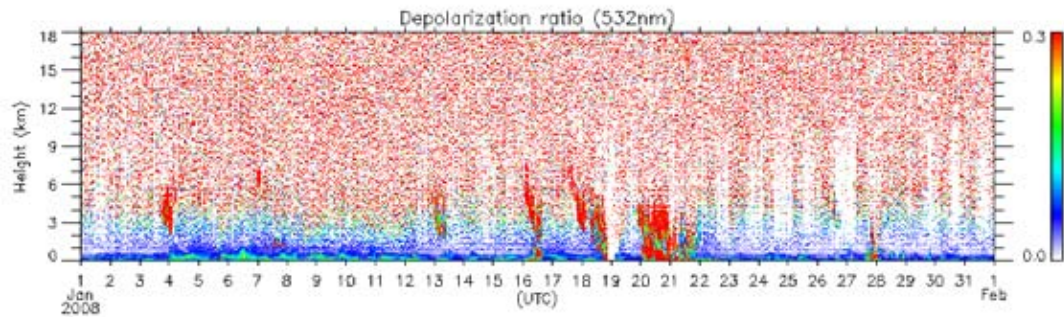
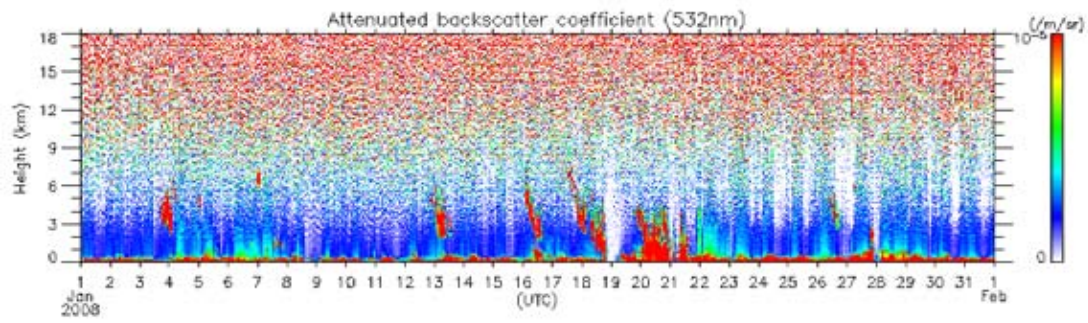


Completion of the Equipment Installation Work at Ulaanbaatar
10 September, 2007



Completion of the Equipment Installation Work at Ulaanbaatar
10 September, 2007

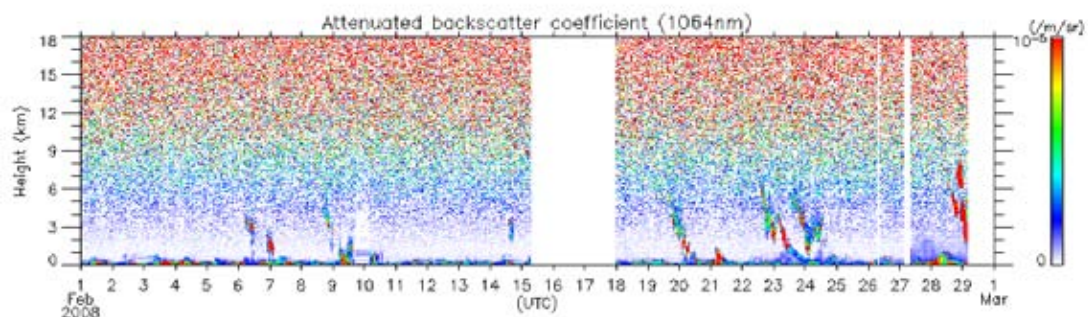
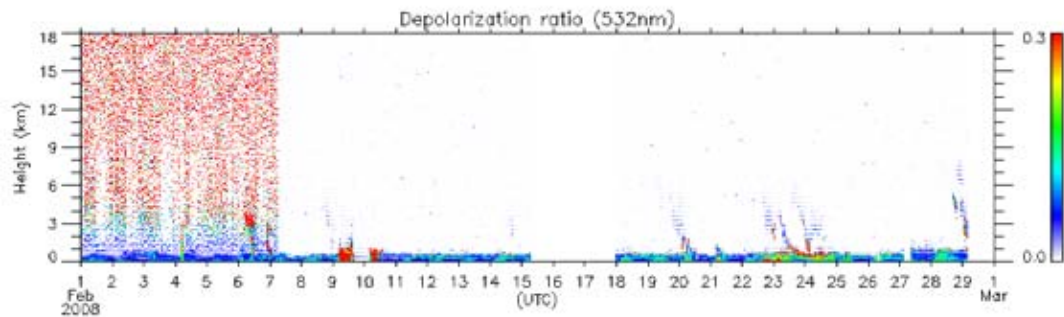
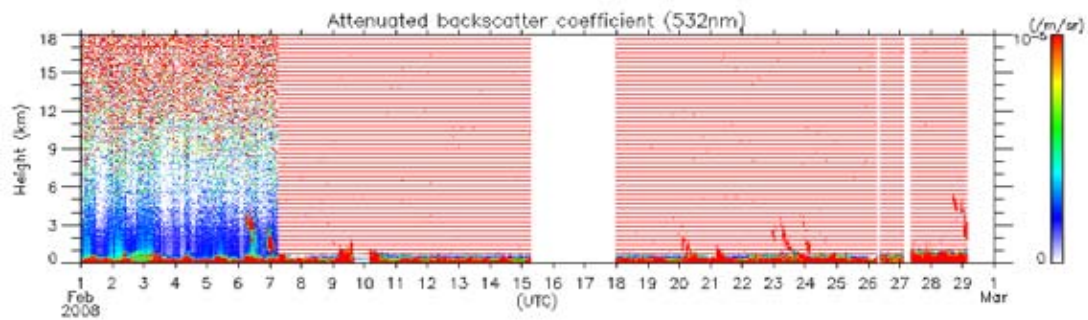
Lidar Observation in Ulaanbaatar



NAMHEM/NIES

Created:Fri Feb 1 11:40:55 2008(JST)

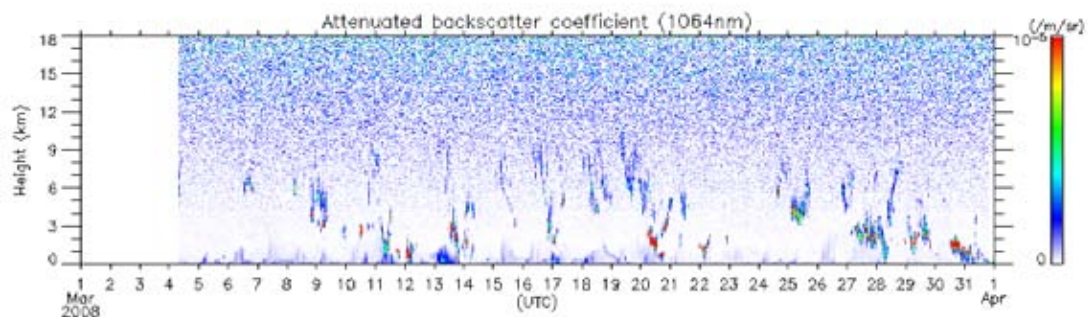
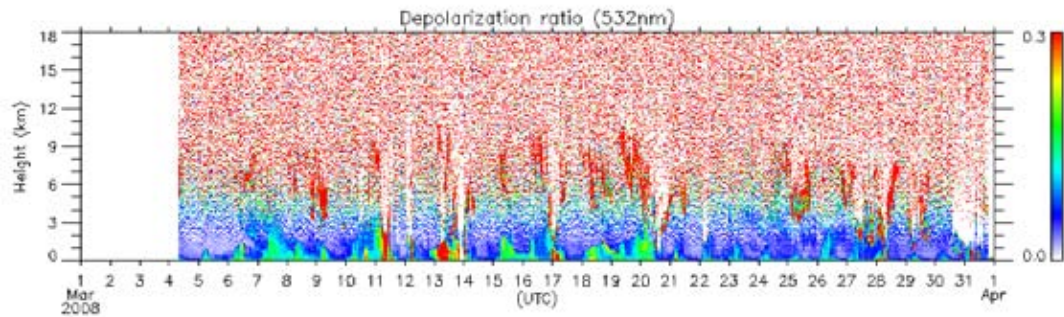
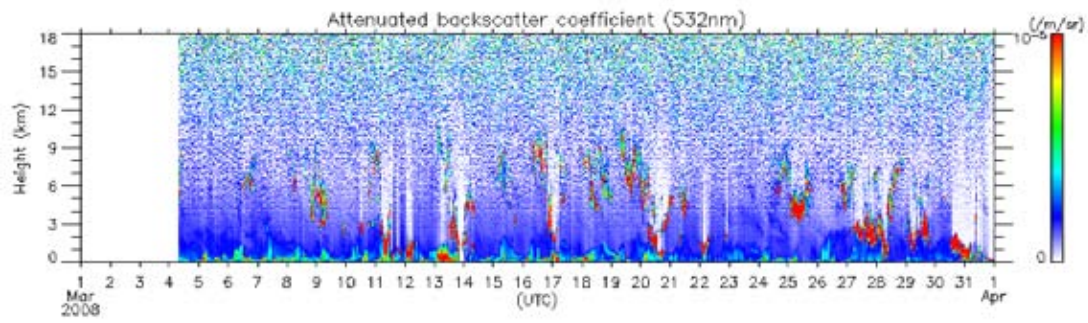
Lidar Observation in Ulaanbaatar



NAMHEM/NIES

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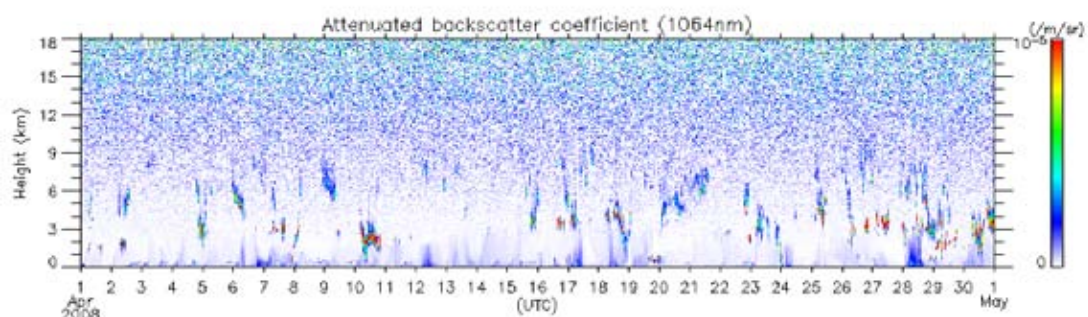
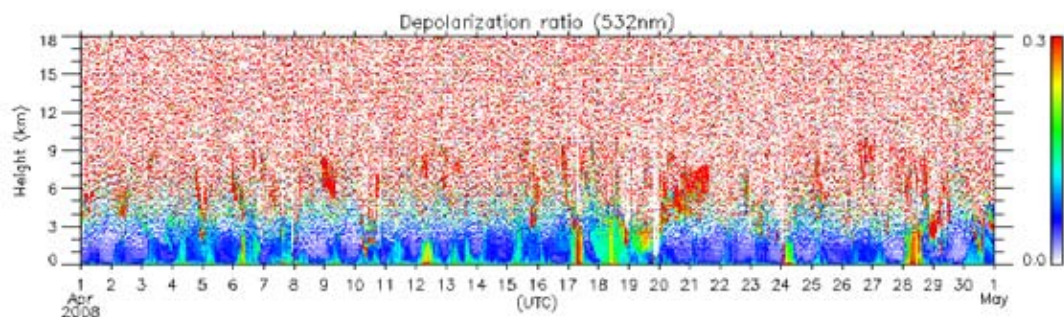
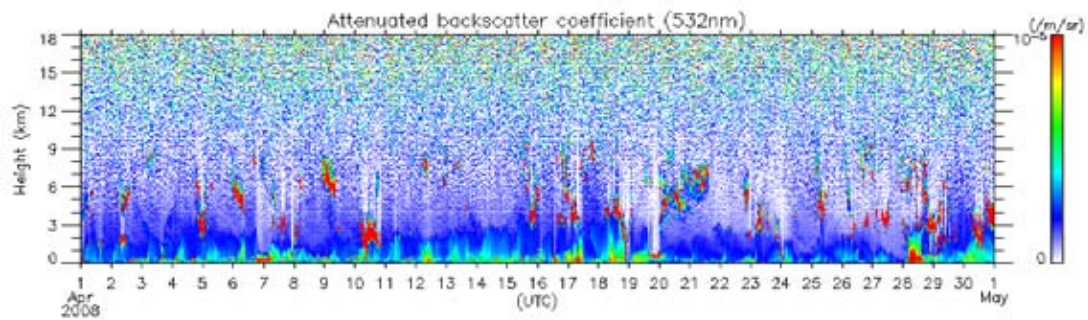
Lidar Observation in Ulaanbaatar



NAMHEM/NIES

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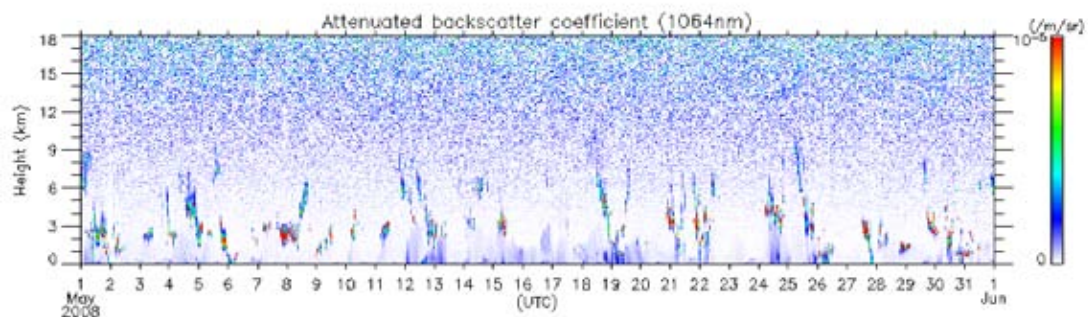
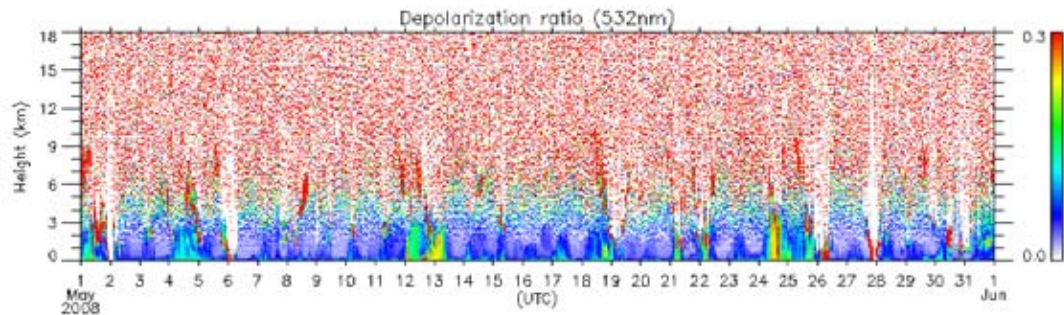
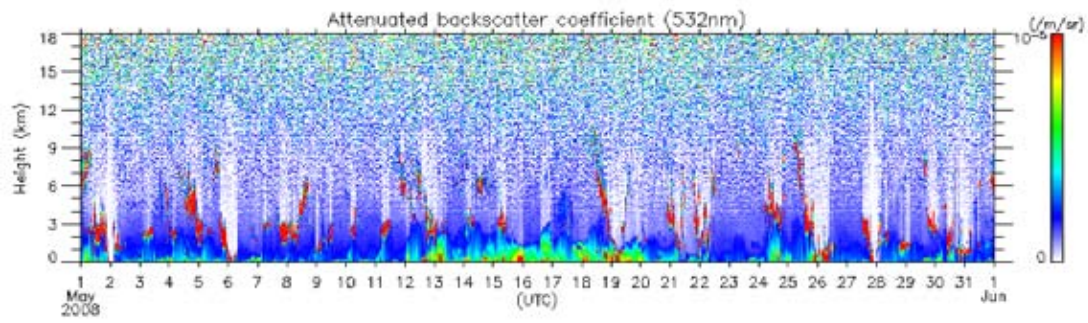
Lidar Observation in Ulaanbaatar



NAMHEM/NIES

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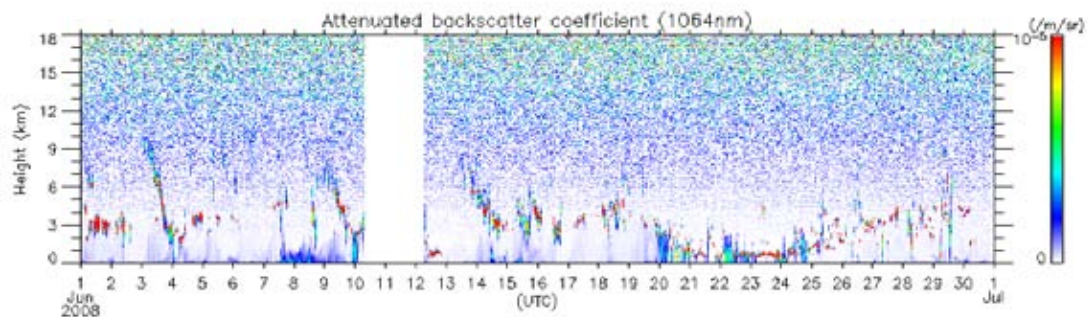
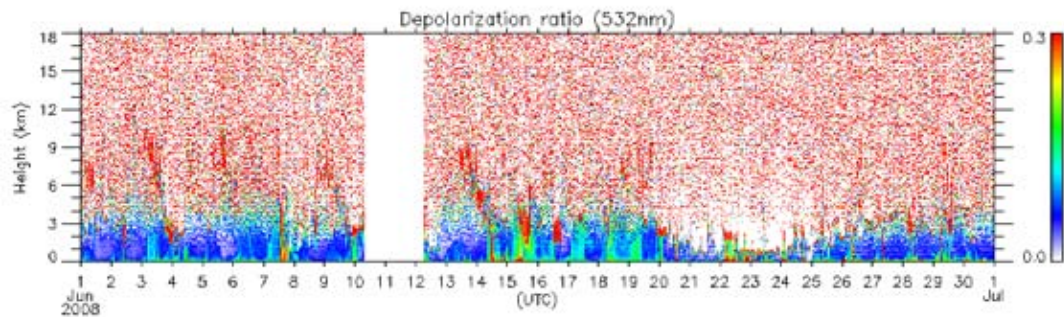
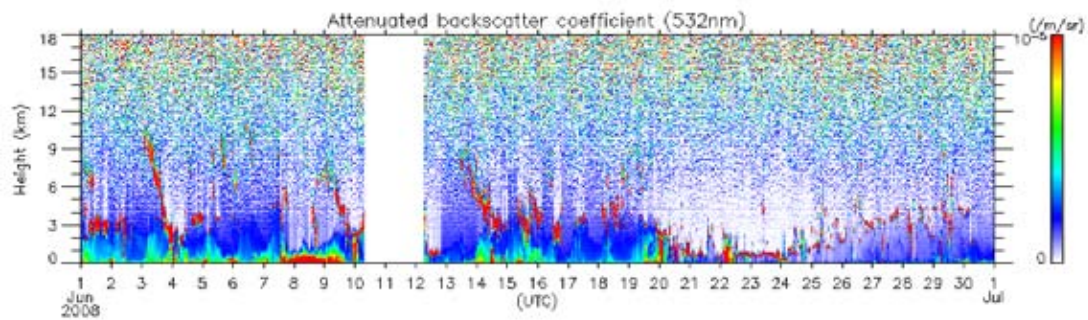
Lidar Observation in Ulaanbaatar



NAMHEM/NIES

Created:Sun Jun 1 11:38:01 2008(JST)

Lidar Observation in Ulaanbaatar



NAMHEM/NIES

Created:Tue Jul 1 11:31:53 2008(JST)

Lidar Observation in Ulaanbaatar

