

ThalesAlenia
A Thales / Finmeccanica Company *Space*

Multicast architecture for IPv6 over DVB-RCS satellite networks

INNSS07, Budapest 7th July

THALES

New Generation Satellite Networks (NGSN): OBP

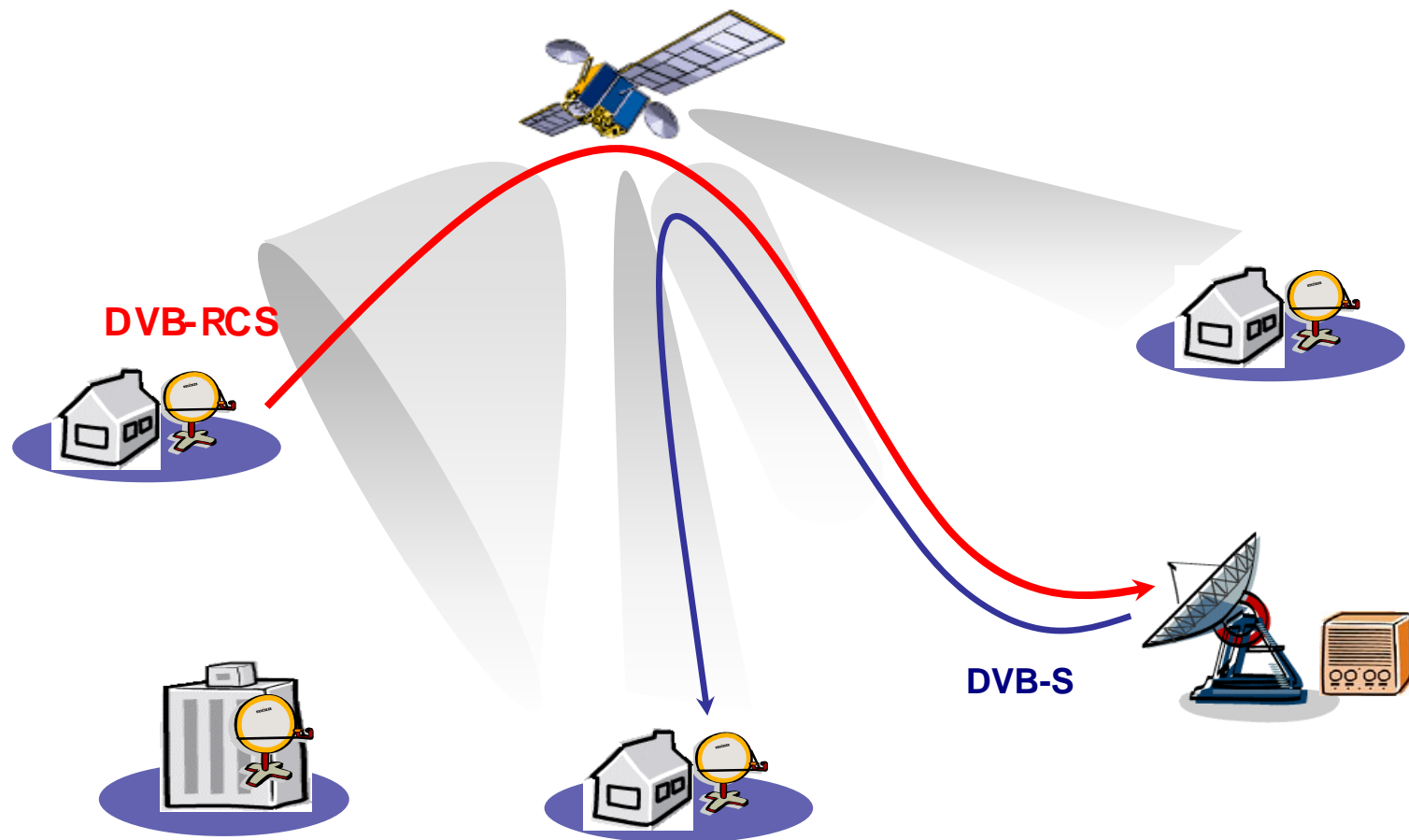
- IP multicast scenarios

IPv6 Multicast over Satellite Networks

- IP multicast in IPv6
- DVB-RCS/DVB-S networks multicast approach

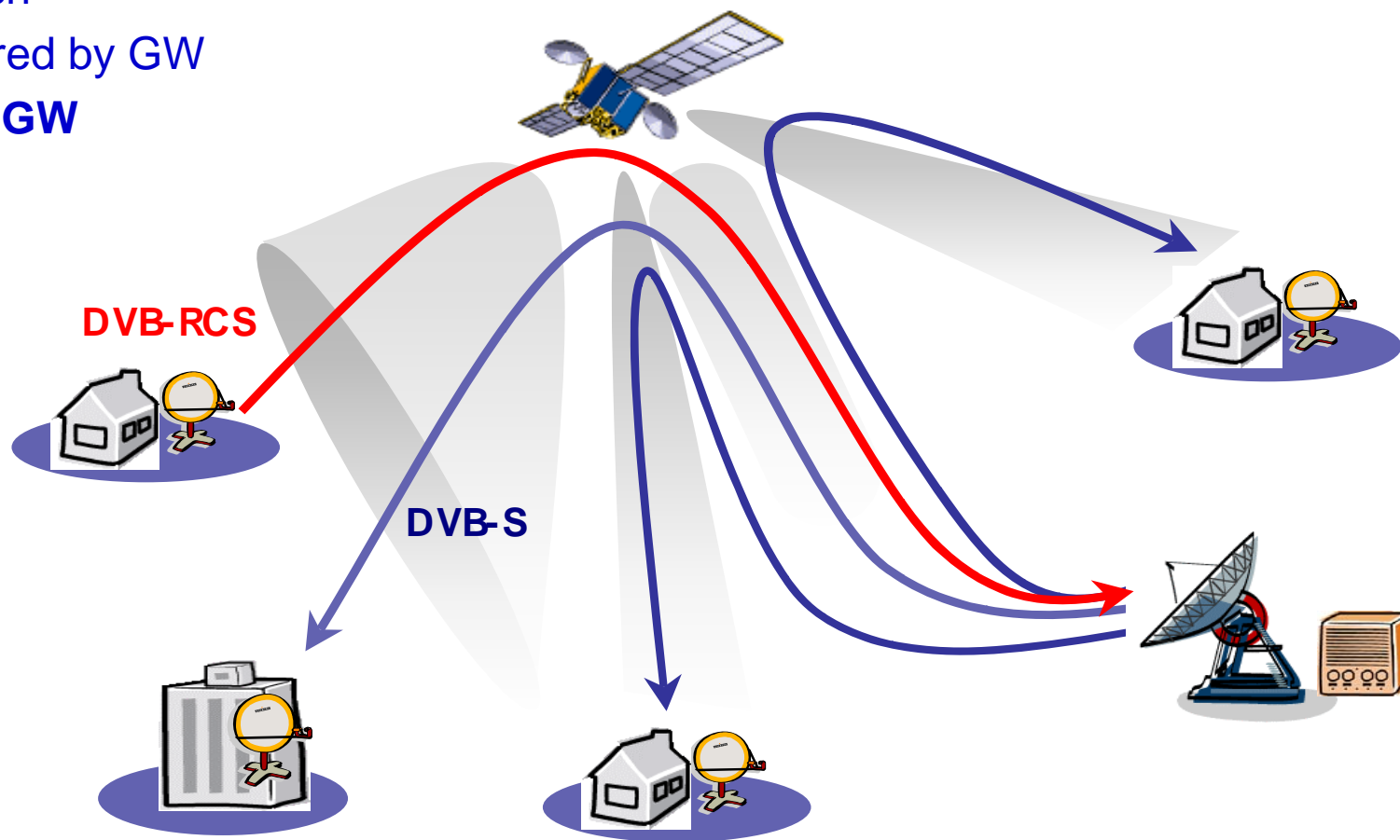
SATSIX solution based on C2P

BSM Star/Mesh Mono/Multibeam Transparent network



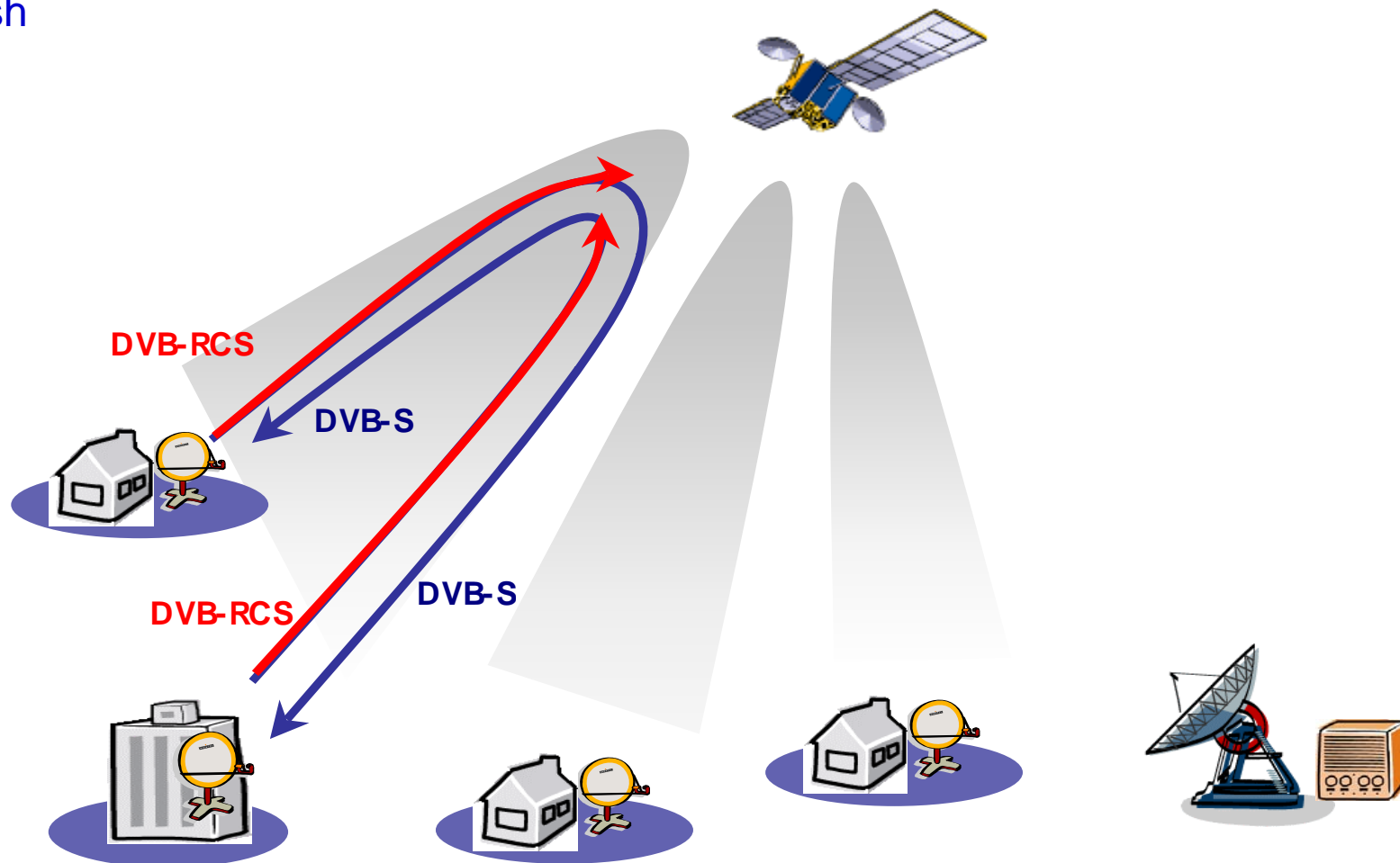
BSM Star/Mesh Mono/Multibeam Transparent network

- Double hop for mesh
- Multicast data entered by GW
- replication on the GW



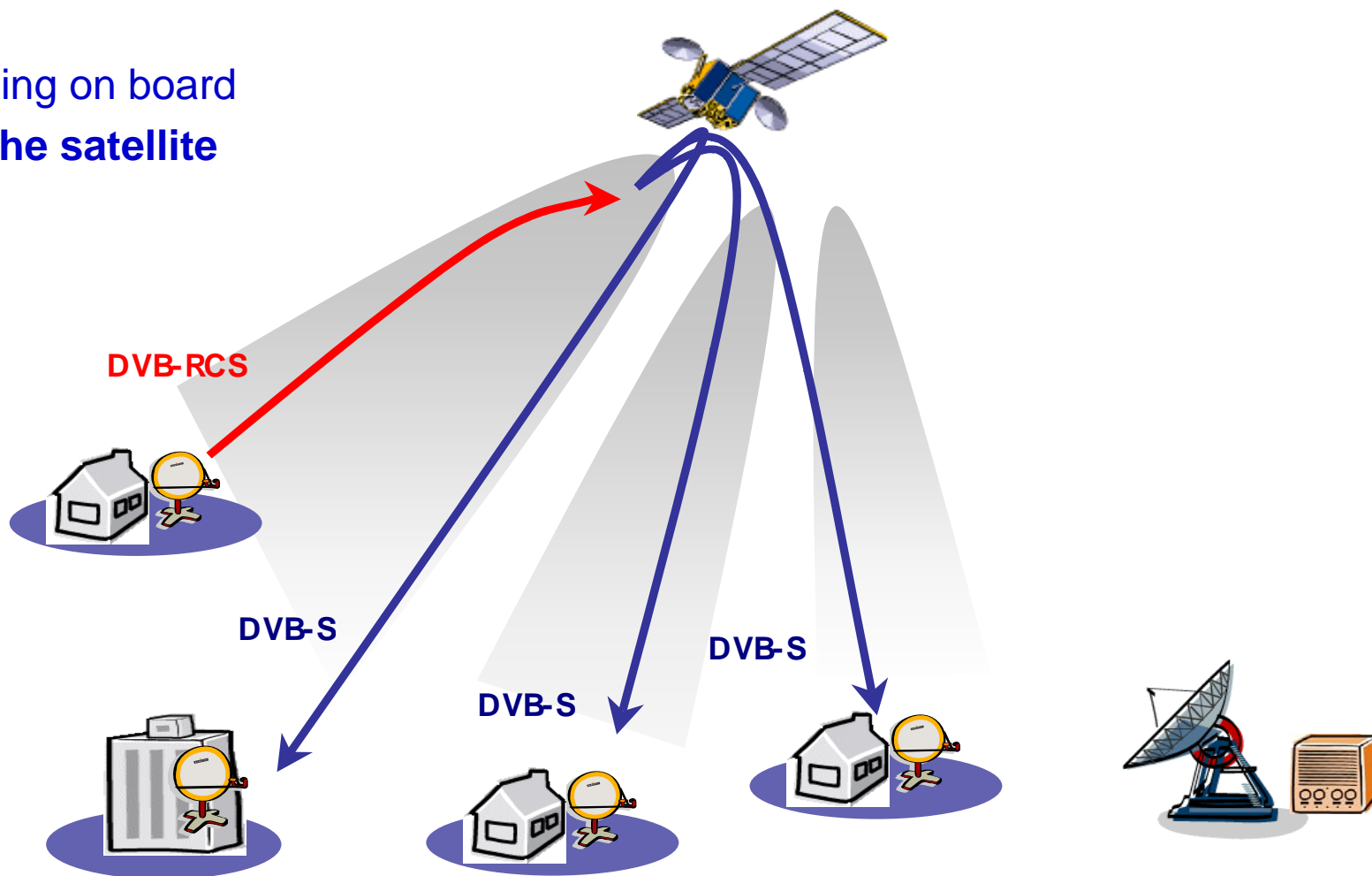
BSM Star/Mesh Mono/Multibeam Regenerative network

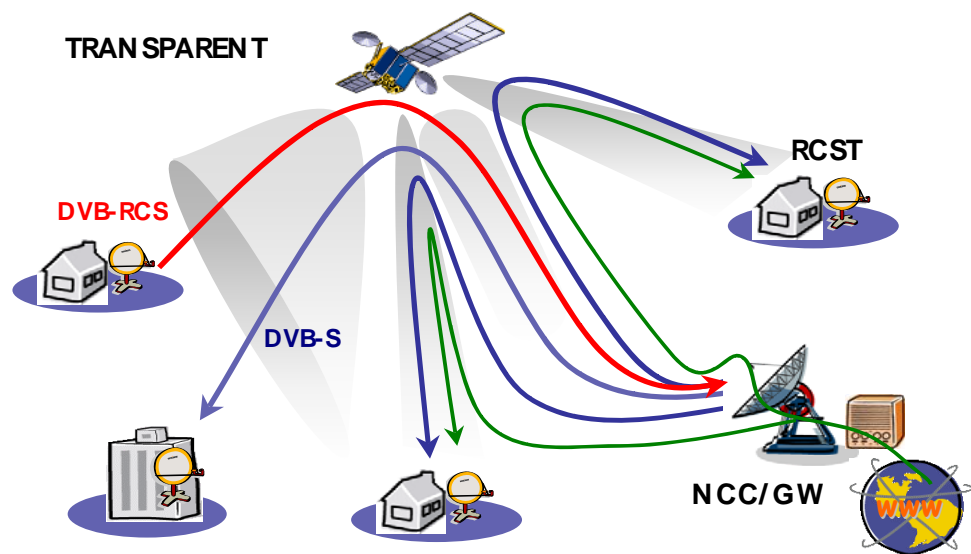
- Single hop for mesh



BSM Star/Mesh Mono/Multibeam Regenerative network

- Single hop for mesh
- Replication & switching on board
- Real multicast on the satellite



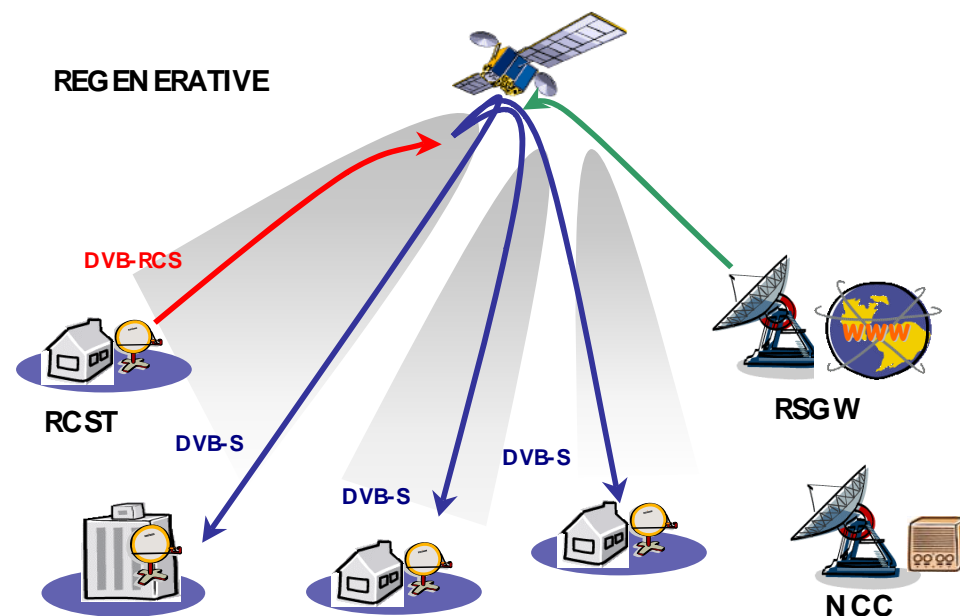


Multicast groups mgmt

- **static:** no control of multicast groups members
- **dynamic:** control of join/leaves of multicast group members

Multicast source

- TSGW or RSGW src multicast
- RCST src multicast



Moving from IPv4 to IPv6 multicasting

- Addressing model in IPv6: prefix '1111 1111' + Multicast group ID (112 bits)
- MLD for IPv6: to discover multicast listeners
- Multicast routing protocol: PIM-SM or PIM-SSM

DVB-S(2)/DVB-RCS standard systems

- Address resolution for IP over MPEG2
- Mapping multicast address to MPEG2 PIDs
- IP/MAC Notification Table (INT)
- Application Information Table (AIT)
- Multicast Map Table (MMT)

Dynamic multicast group management over satellite

- IGMP/MLD adaptation over satellite
- C2P for IGMP/MLD embedded functionality

SATSIX Star dynamic multicast based on IGMP/MLD adaptation and C2P

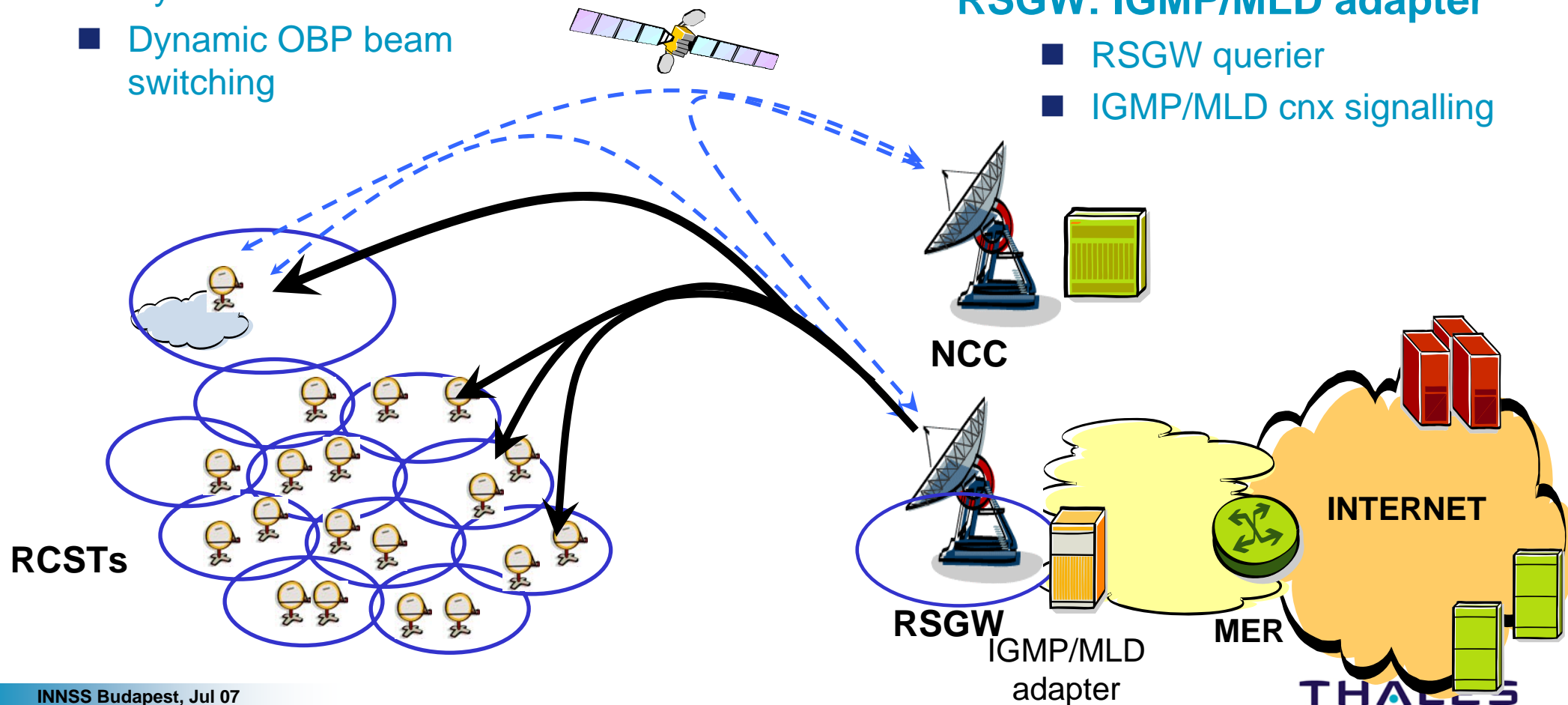
MMT, C2P

- Dynamic multicast cnxs
- Dynamic OBP beam switching

RCST: IGMP/MLD proxy

RSGW: IGMP/MLD adapter

- RSGW querier
- IGMP/MLD cnx signalling

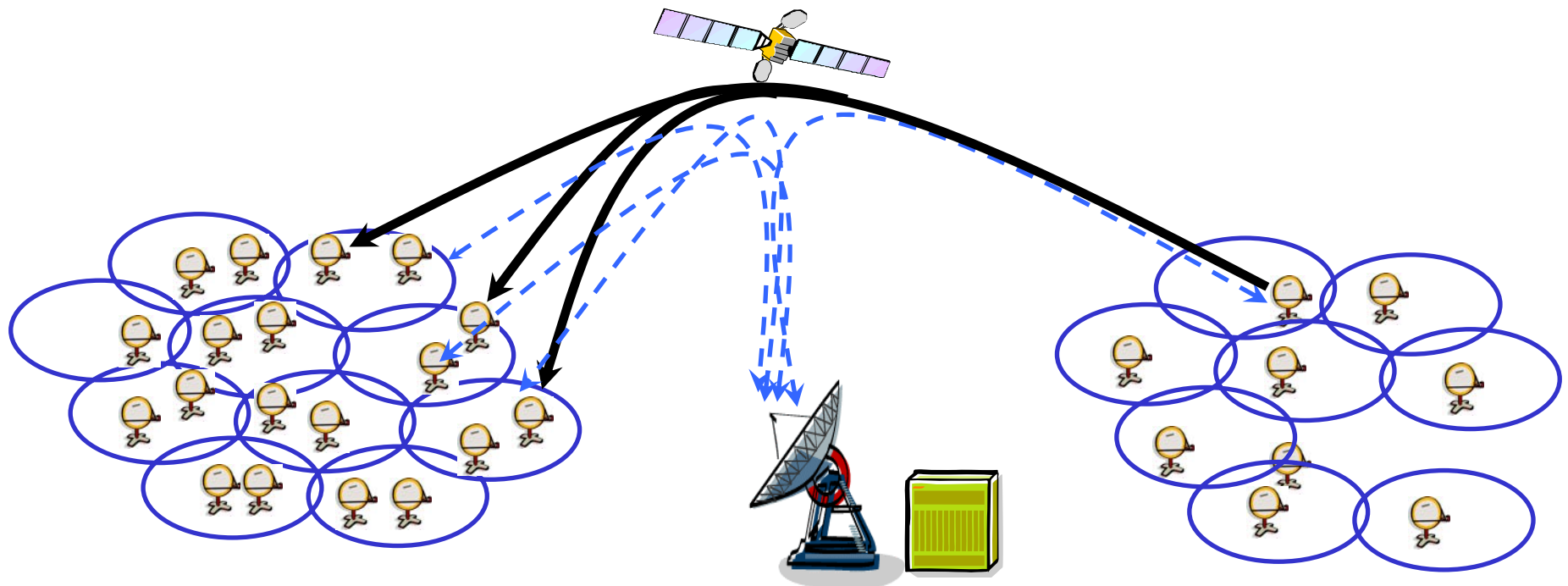


SATSIX Mesh dynamic multicast based on IGMP/MLD adaptation and C2P

MMT, C2P

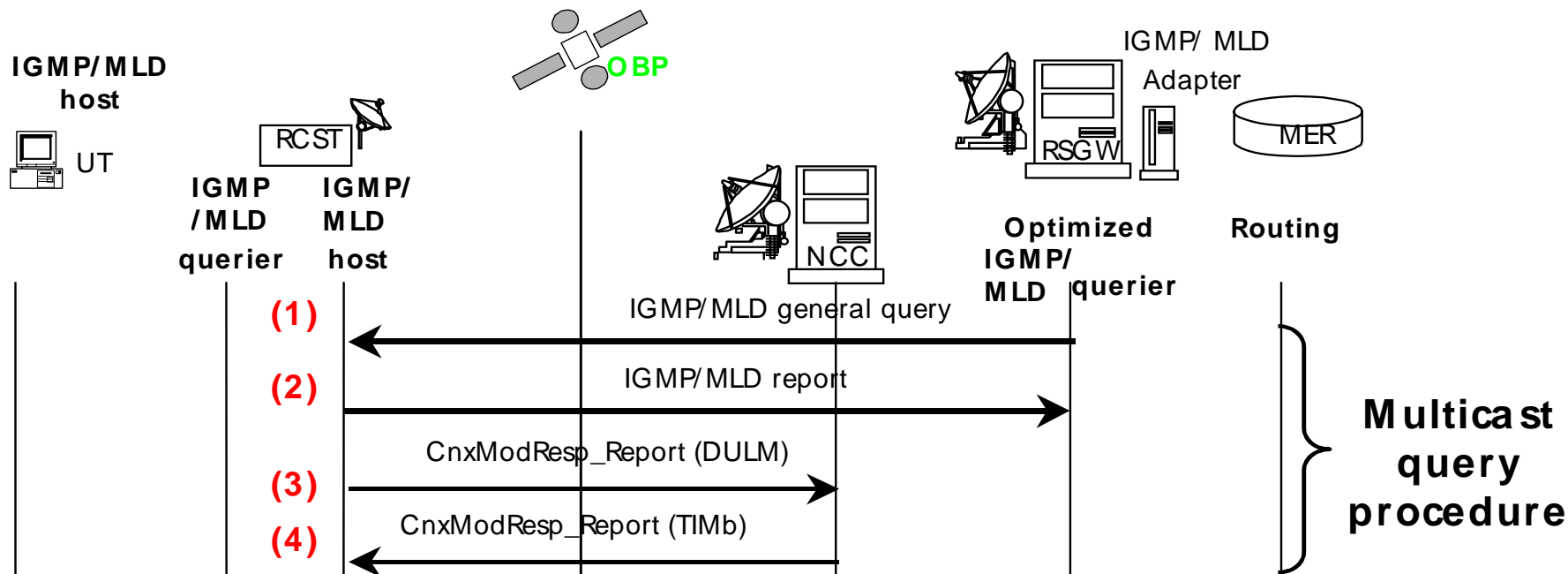
- Dynamic multicast cnxs
- Dynamic OBP beam switching

RCST: IGMP/MLD proxy /querier



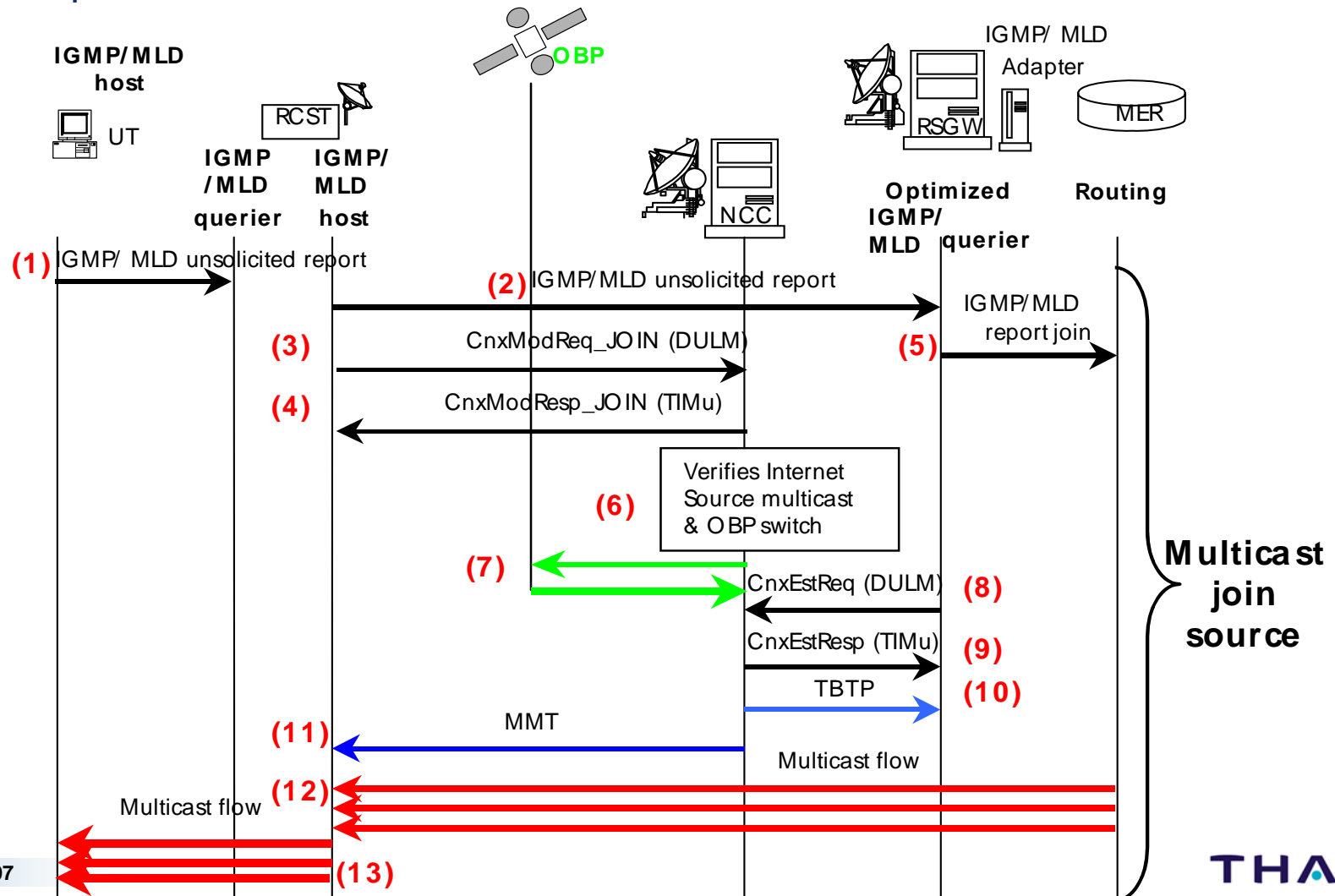
Star dynamic multicast based on IGMP/MLD adaptation **AND C2P**

- General query / report procedure



Star dynamic multicast based on IGMP/MLD adaptation AND C2P

■ Join procedure



SatSix multicast scenarios

- Star / Mesh
- Transparent / Regenerative (OBP based)
- Static / Dynamic multicast group management

IPv6 over DVB-RCS/DVB-S(2) satellite networks

- MLDv2 adaptation (as IGMPv2 adaptation for IPv4)
- MMT
- C2P supporting IPv6 and dynamic multicasting

Future work

- Embedded IGMP/MLD functionality in C2P
- RCSTs as real multicast routers
 - PIM-SM adaptation
 - Embedded PIM-SM in C2P

Star dynamic multicast based on IGMP/MLD adaptation AND C2P

■ Group specific query/report and leave procedure

