INFRASTRUCTURE OF THE FUTURE REDDIG

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OBJECTIVE

Describe the infrastructure of the future SAM network (REDDIG II)

CONTENT

- **General considerations**
- **Future architecture of the REDDIG**

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- **General considerations**
- **Future architecture of the REDDIG**

SATELLITE TRANSMISSION

- Deterministic network;
- Delays;
- Jitter only associated to applications

GROUND TRANSMISSION

- Statistical network (current);
- Jitter (routers);
- No major delays

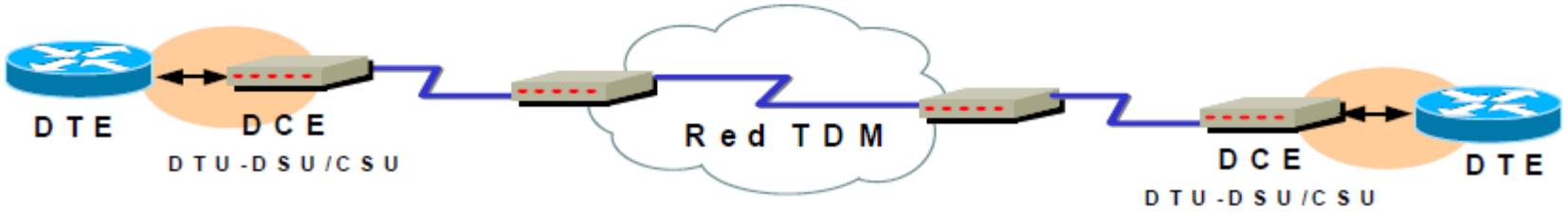
GROUND NETWORK

- Dedicated lines - “Clear-channel”; and
- Contracting of services – statistical networks

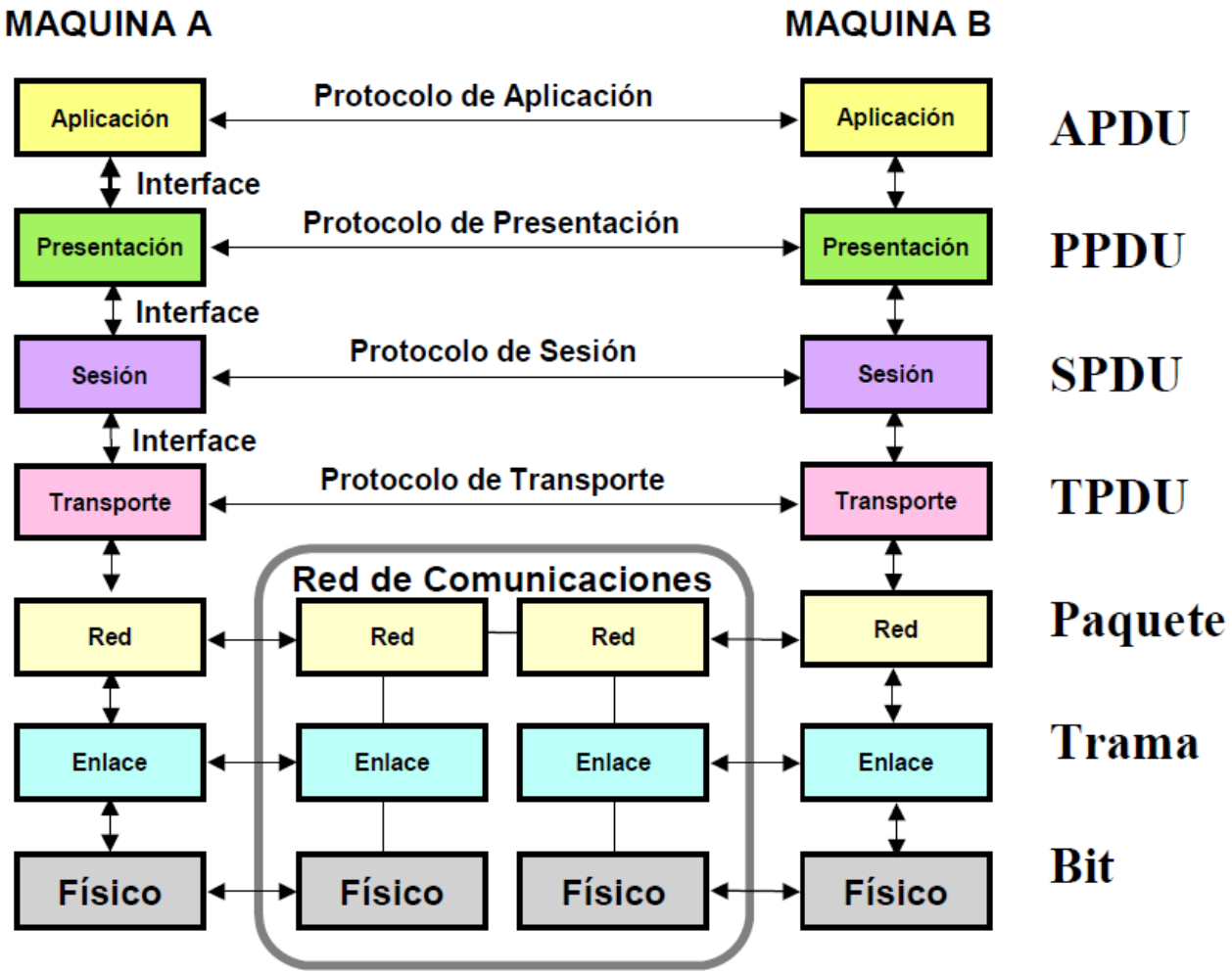
GROUND NETWORK

Componentes

- Puerto de router
- CSU/DSU - DTU
- Circuito del carrier

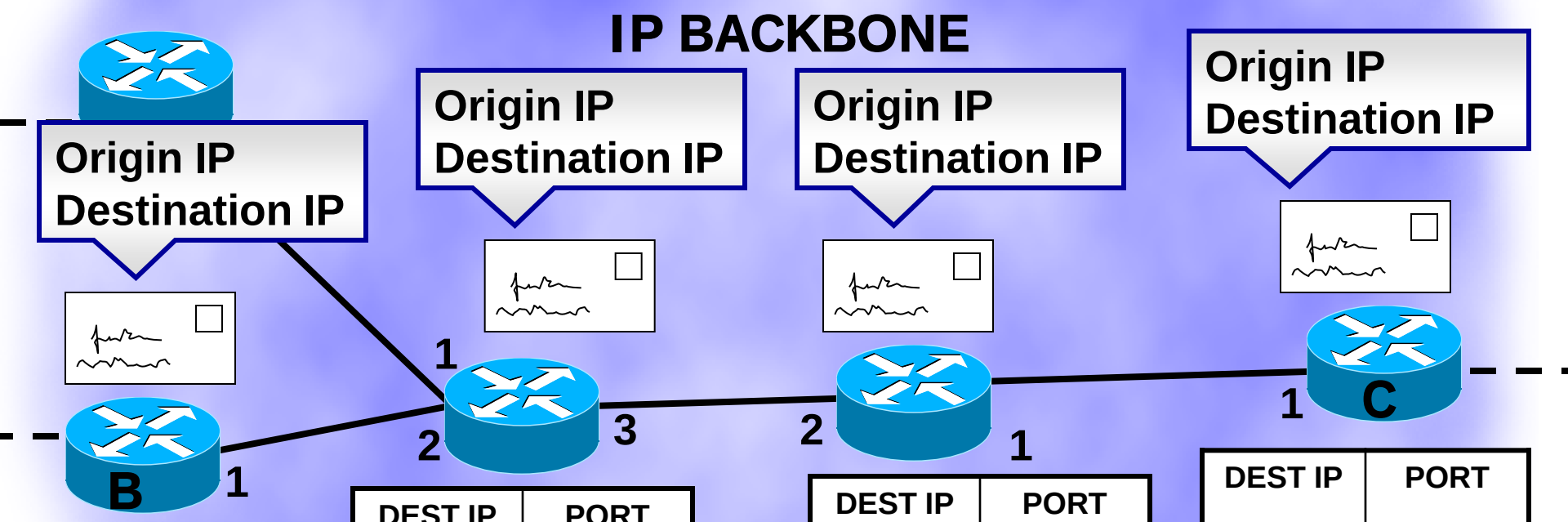


OSI REFERENCE MODEL



How it works

Traditional packet switching



DEST IP	PORT
B	Local
A	1
C	1

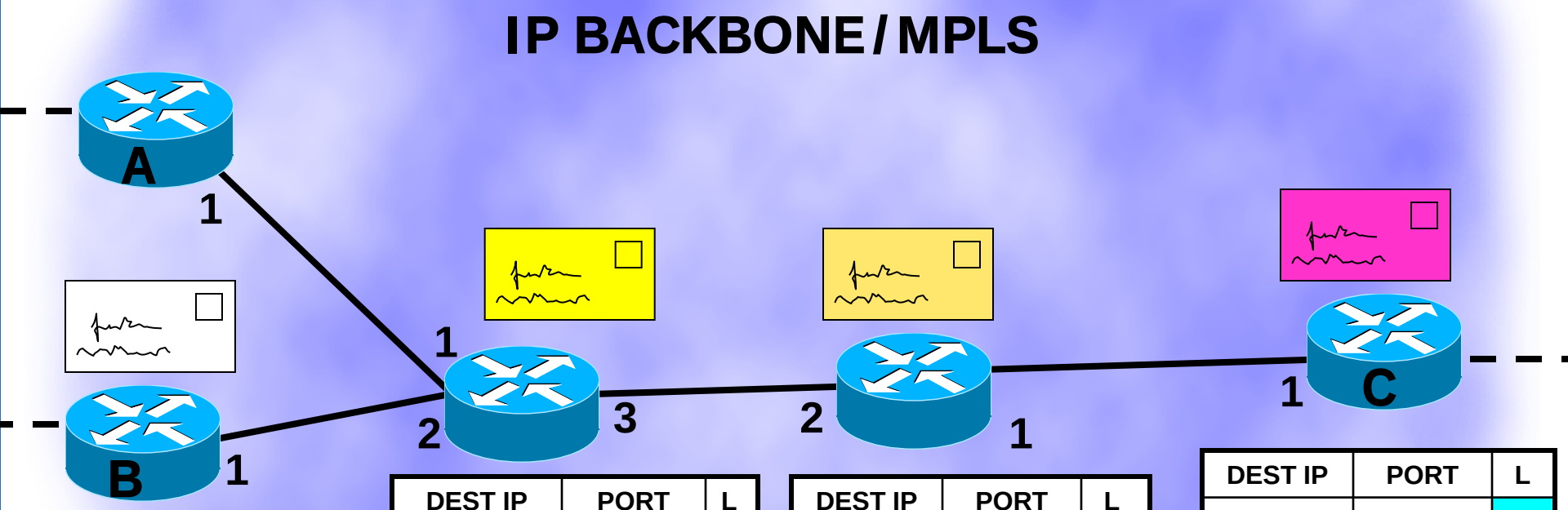
DEST IP	PORT
A	1
B	2
C	3

DEST IP	PORT
A	2
B	2
C	1

DEST IP	PORT
C	Local
A	1
B	1

How it works

MPLS



DEST IP	PORT	L
B	Local	
A	1	
C	1	

DEST IP	PORT	L
A	1	
B	2	
C	3	

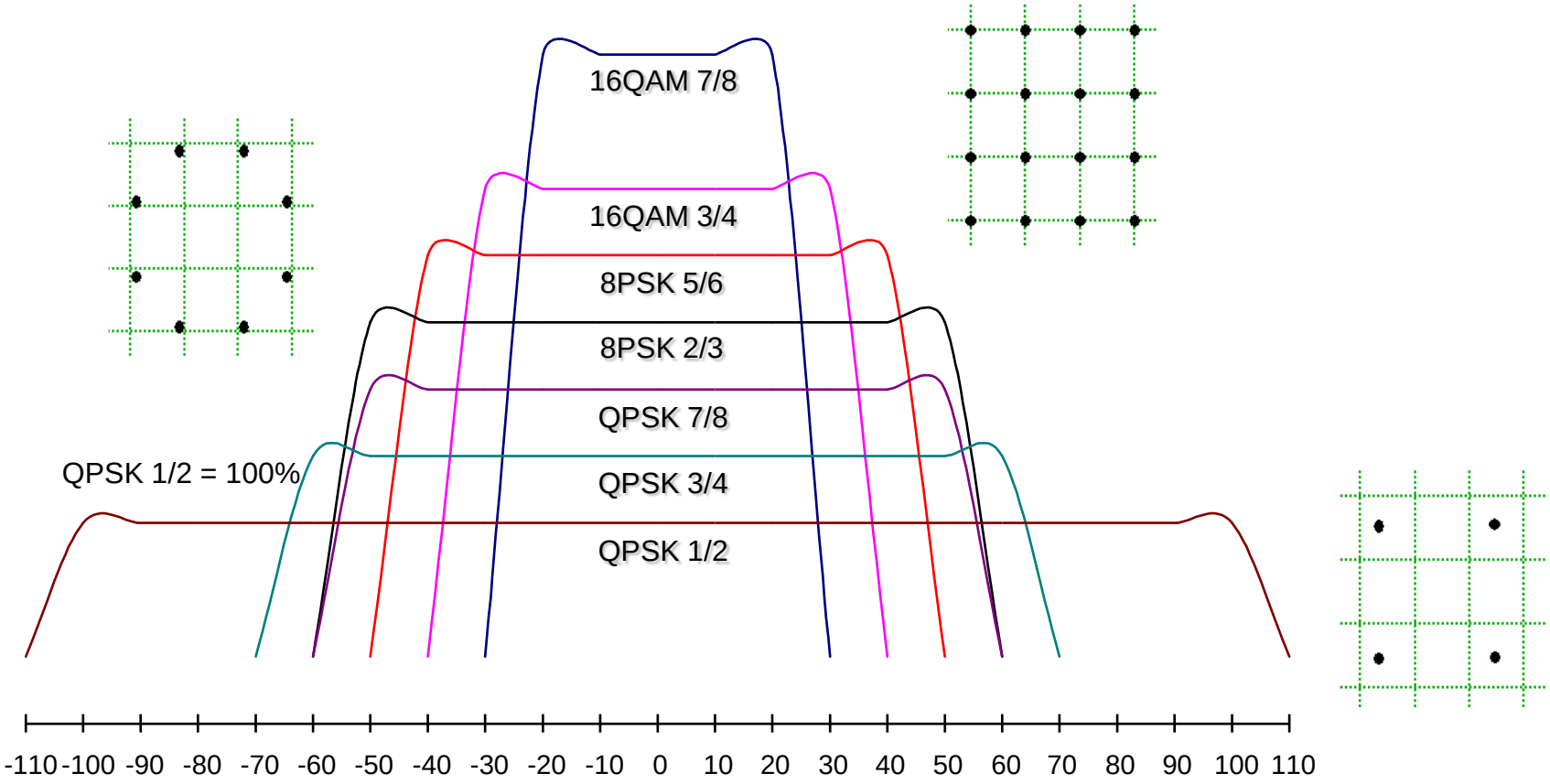
DEST IP	PORT	L
A	2	
B	2	
C	1	

DEST IP	PORT	L
C	Local	
A	1	
B	1	

Advantages of MPLS

- Better control of consumption of network resources (TE)
- Availability of new services over IP
  1. **VPNs;**
  2. **Faster; and**
  3. **IP intelligence and deterministic performance**

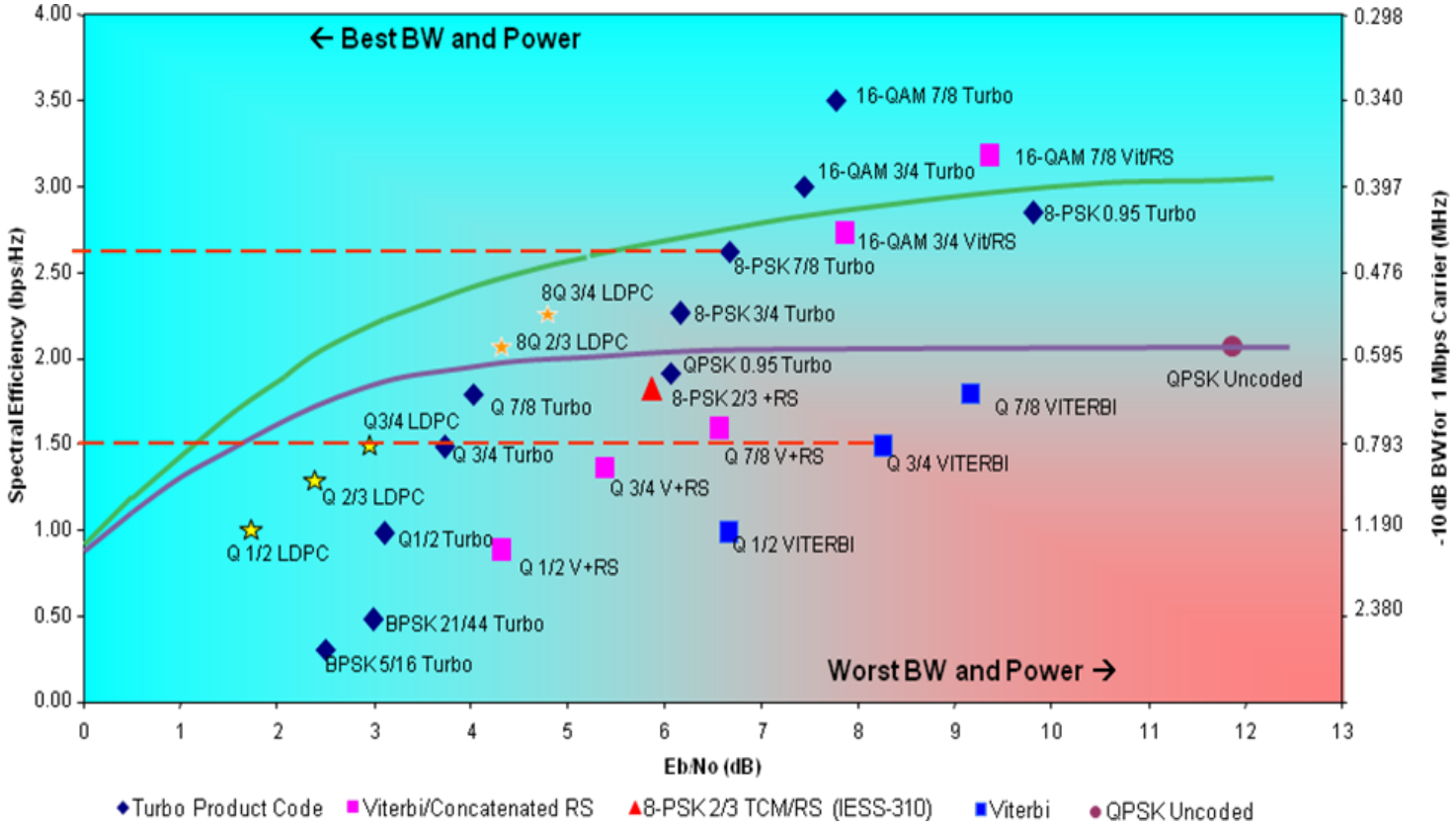
SATELLITE (BW x Power)



Claude Shannon

- “The father of the Information Theory”;
- Mathematical model of the theory (1948);
- Channel capacity;
- Enthropy;
- “Shanon boundary”;
- “Fonte coding” → FEC.

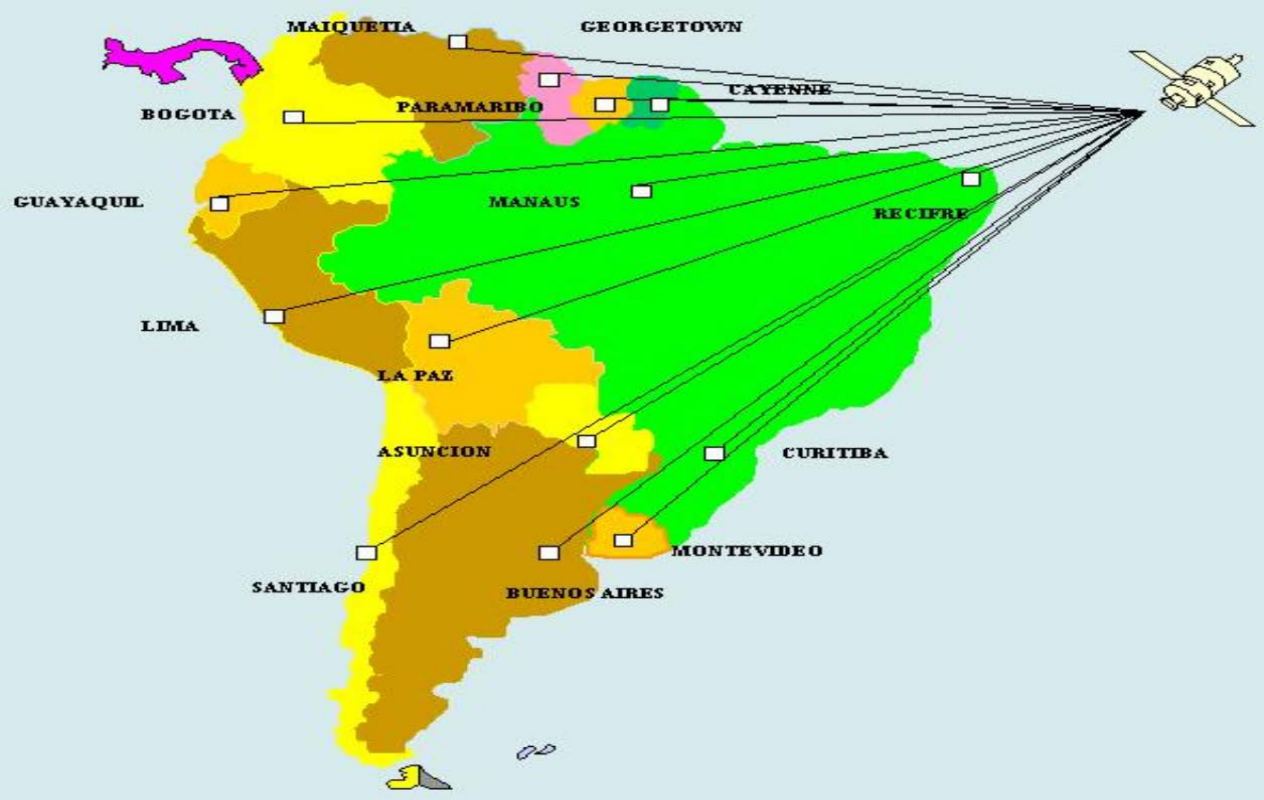
SATELLITE (BW x power)



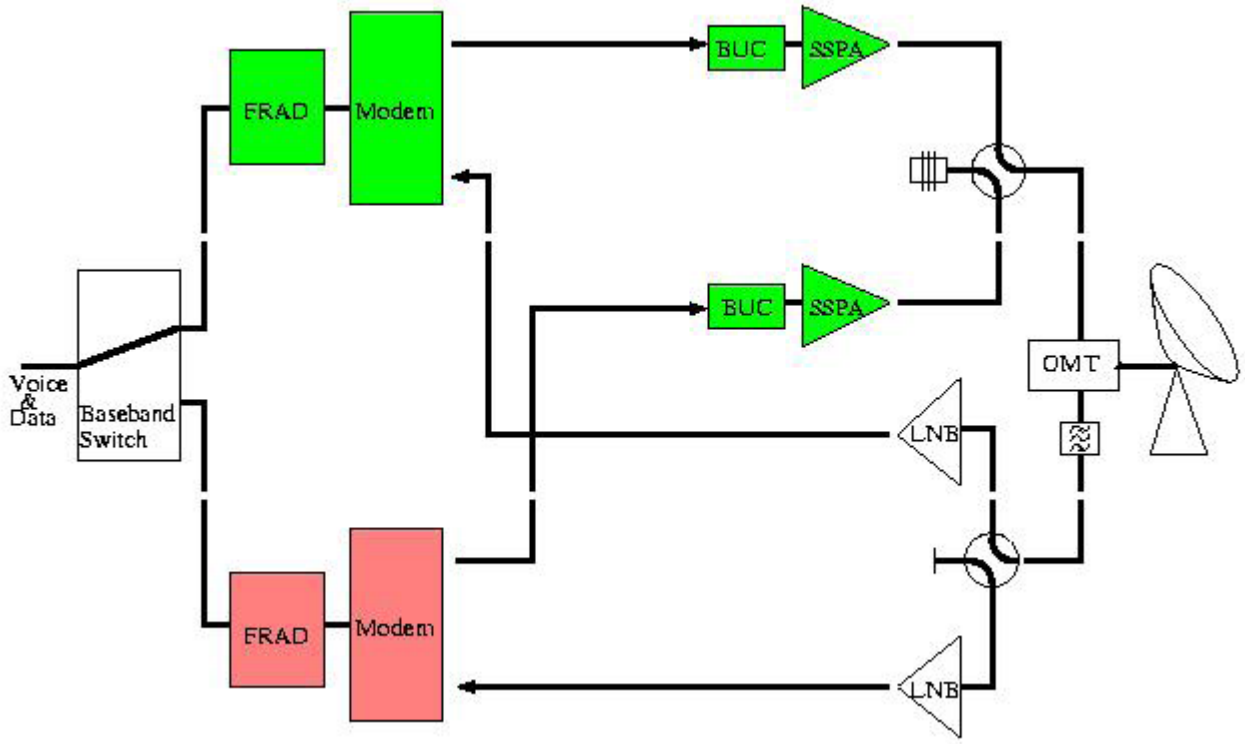
CONTENT

- General considerations
- **Future architecture of the REDDIG**

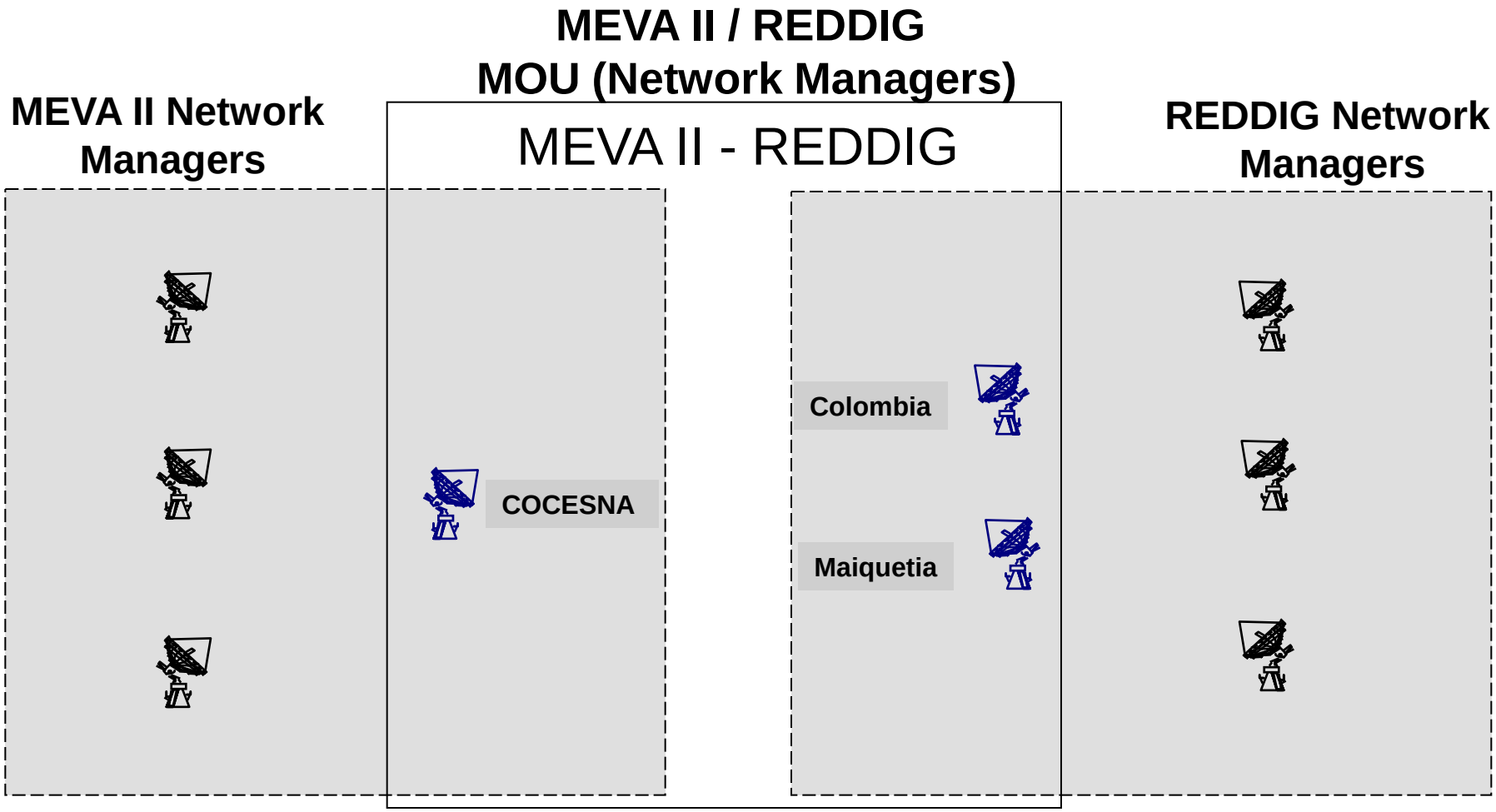
CURRENT TOPOLOGY



CURRENT TOPOLOGY



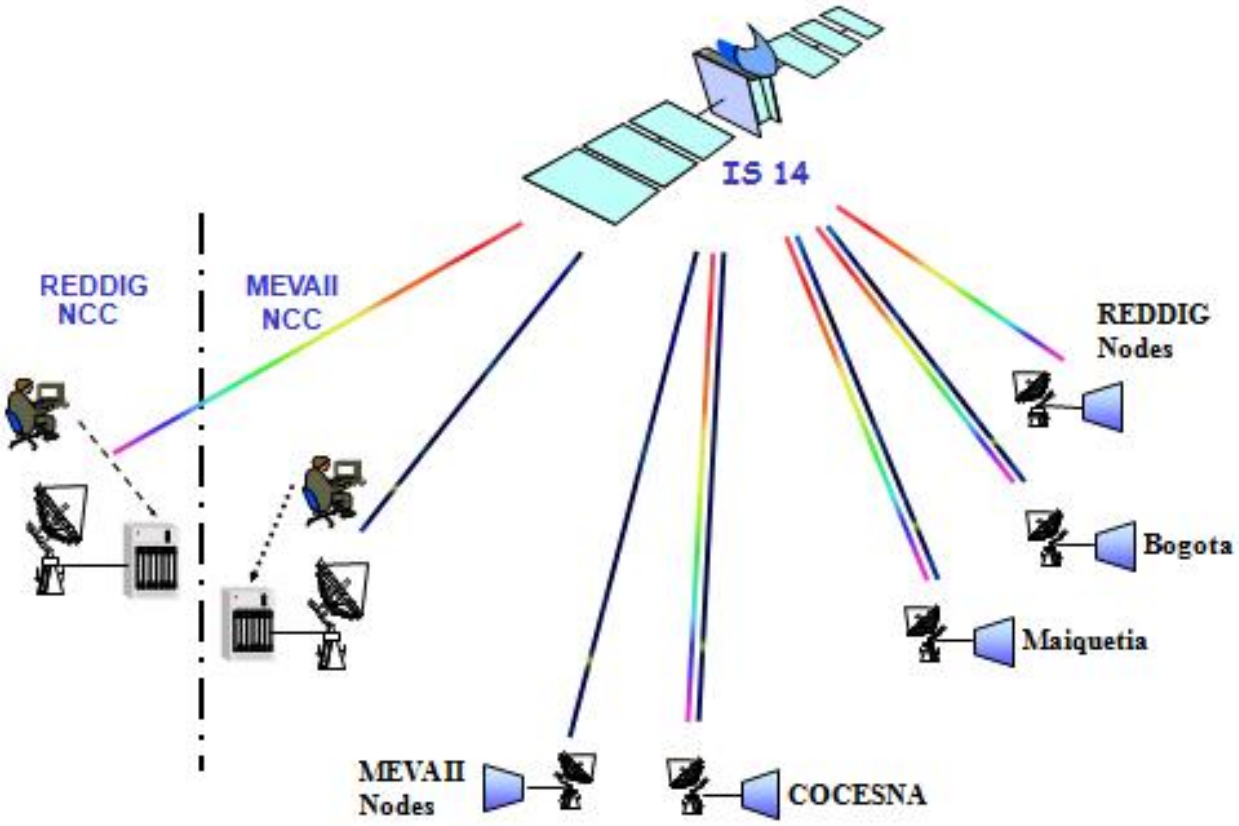
MEVAII/REDDIG INTERCONNECTION



MOU: Technnical Agreement between Managers for sharing resources

I^2 Nodes with Modified REDDIG Nodes

MEVAII/REDDIG INTERCONNECTION



FUTURE TOPOLOGY - ASSUMPTIONS

- Main medium: satellite (own network);
- IP backup and flexibility: ground (contracted network).

INITIAL STUDY

ESTUDIOS PRELIMINARES A REALIZAR PARA EL CAMBIO DE LA PLATAFORMA TECNOLOGICA DE LA REDDIG

(Información elaborada por el Grupo ad Hoc conformado por Argentina, Brasil y Perú)

1.1 Para el estudio se tuvieron en cuenta los siguientes criterios:

- 1.1.1. Disponibilidad.
- 1.1.2. BER
- 1.1.3. Ancho de Banda (BW).
- 1.1.4. Tecnología actual (equipamiento instalado).
- 1.1.5. Tipos de servicios a ser implementados.
- 1.1.6. Proveedor de telecomunicaciones único.

1.2 Considerando los criterios determinados anteriormente se propone:

1.2.1. Caso 1:

- 1.2.1.1. Analizar una red terrestre principal para las aplicaciones actuales y ATN y los anchos de bandas necesarios.
- 1.2.1.2. Analizar una red satelital de backup para casos de contingencia.

1.2.2. Caso 2:

- 1.2.2.1. Analizar una red satelital principal para las aplicaciones actuales y ATN y los anchos de bandas necesarios.
- 1.2.2.2. Analizar una red de backup para casos de contingencia.

1.2.3. Determinar el equipamiento apropiado.

1.2.4. Realizar estudios de costo beneficio para cada una de las soluciones propuestas.

1.2.5. La solución definitiva (cambio progresivo o completo) será analizada luego de disponer de los costos asociados para poder estudiar el impacto en cada una de ellas.

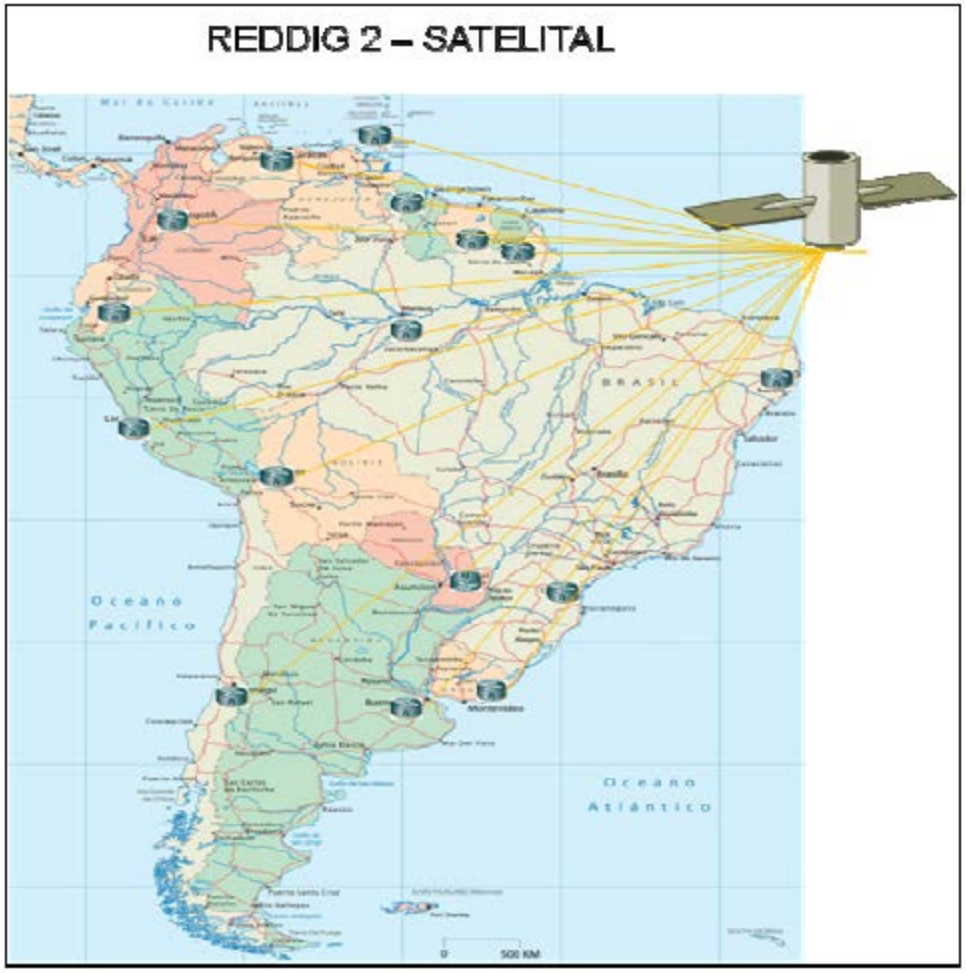
INITIAL STUDY

Disponibilidad Satélite			
D1	D2	Dparalelo	Descripción
99,000000%	99,000000%	99,990000%	Disponibilidad Enrutador
99,000000%	99,000000%	99,990000%	Disponibilidad MODEM
99,000000%	99,000000%	99,990000%	Disponibilidad SSPA
Dsistema:		99,970000%	

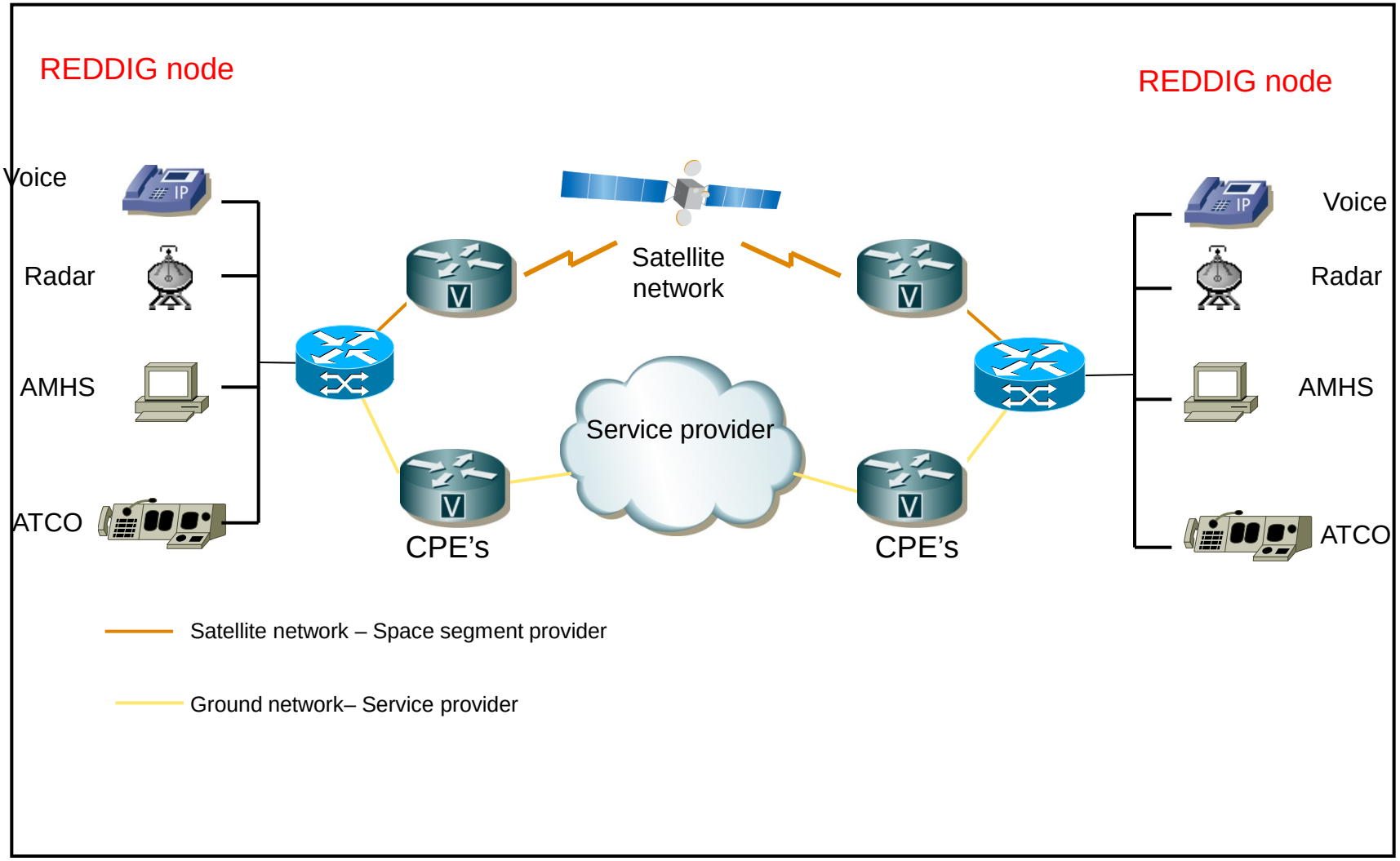
Disponibilidad Terrestre			
D1	D2	Dparalelo	Descripción
99,500000%		99,500000%	Disponibilidad Global
Dsistema:		99,500000%	

Disponibilidad de los dos sistemas em paralelo:	99,9998500000%
Indisponibilidad en minutos por més:	0,06

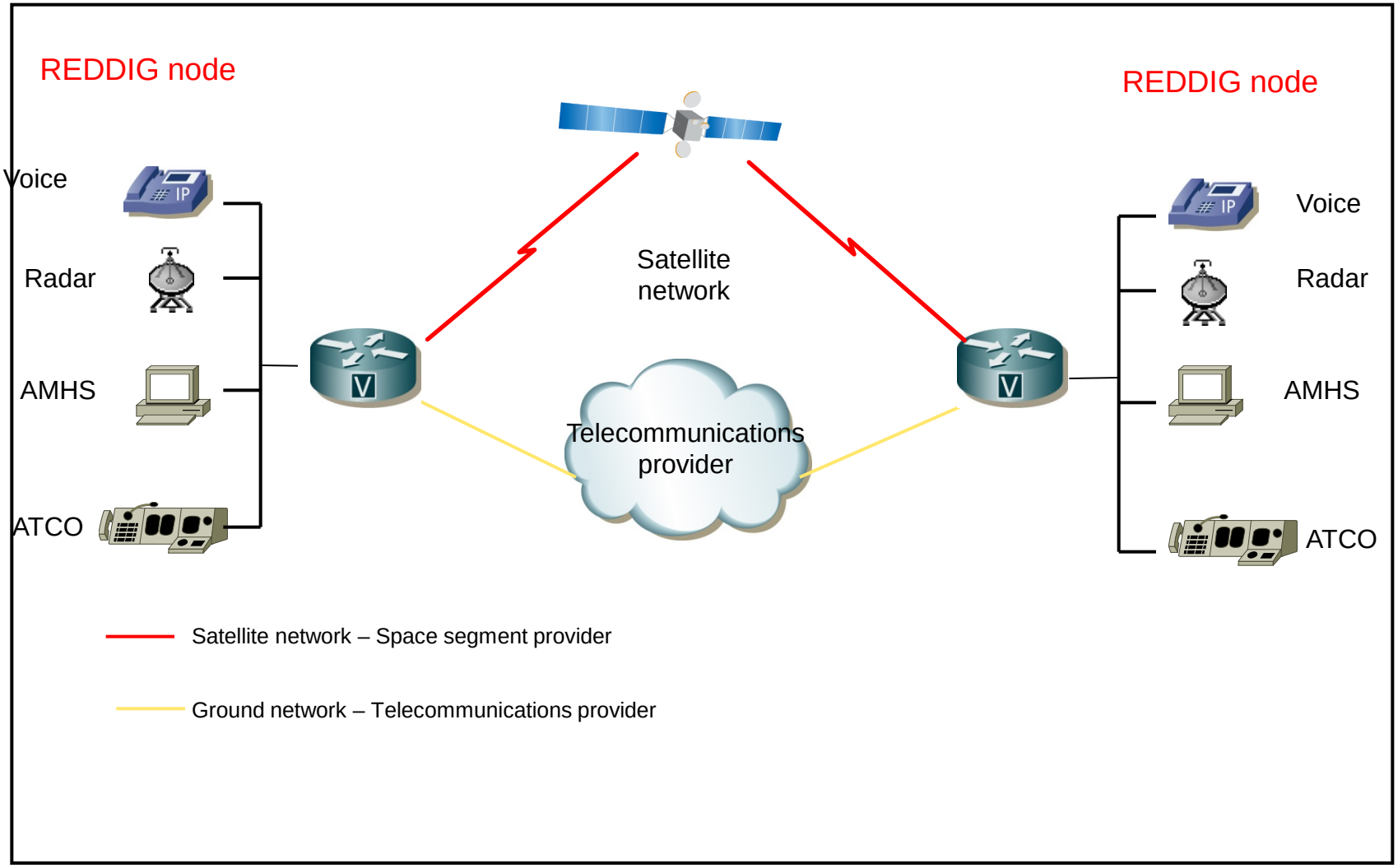
SATELLITE NETWORK



GROUND NETWORK


REDDIG node
REDDIG node
Voice
Radar
AMHS
ATCO
Satellite network
Service provider
CPE's
CPE's
Voice
Radar
AMHS
ATCO
Satellite network – Space segment provider
Ground network– Service provider

- Need to install a “multi-layer-switch”
- Switching in case of failure of the main medium
- Close coordination between the REDDIG Administrator and the service provider for purposes of switching in case of failure of the main medium


REDDIG node
REDDIG node
Voice
Radar
AMHS
ATCO
Satellite network
Telecommunications provider
Voice
Radar
AMHS
ATCO
Satellite network – Space segment provider
Ground network – Telecommunications provider

- State-owned terminal equipment;
- No need to install a “multi-layer-switch”;
- Contracting of “clear-channel” circuits;
- Easy switching to the alternate medium;
- Easy management and control of the two networks

CONTENT

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- **Future architecture of the REDDIG**

OBJECTIVE

Describe the infrastructure for the future SAM network (REDDIG II)

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