



Yemen ISR Design Review

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1.0 RF Plan2.0 Network Architecture3.0 Example Coverage Plots

1.0 RF Plan



• 10 Groundstations with 2 HQ locations depicted below:



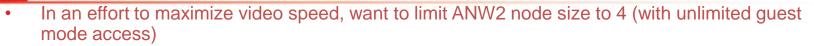
1.0 RF Plan



- LOS links possible between groundstations:
 - Ras Emran \rightarrow YCG HQ & TC in Aden
 - YCG HQ Aden \rightarrow YCG TC Aden
 - Dilami AF HQ → YCG Main HQ (Sana'a)
- Additional links between groundstations possible through Aircraft

Jizan			Prince Radio Link Edit View Swap Azimuth=74.54* Free Space=113.2 dB PathLoss=141.3dB PathLoss=141.3dB	Obstruction=8.2 dB	Clearance at 28 Urban=5.0 dB Rx level=-100.1	Forest=0.0 dl	3 Statistics=15.0 dB
MIDLCTR_HAJJAH		in the second	Transmitter			Receiver	
AL_SALIF_CTR			RAS_EMRAN_CTR Role	Node	• S2	YCG TC ADEN Role	Node
		J.	Tx system name Tx power Line loss Antenna gain Radiated power	Tower 50w WID3 25 W 43.98 2.8 - 0.4 dB 1 dBi -1.2 d EIRP=18.11 W ERP=	dBm	Rx system name Required E Field Antenna gain Line loss Rx sensitivity	Tower 50w WID3 24.58 dBµV/m 1 dBi -1.2 dBd 2.8 - 0.4 dB 1.4125µV -104 dBm
AL_KHAWKHAH_CTB	Taiz	and the	Antenna height (m)	10 . +	Undo	Antenna height (m) Frequency (MHz)	10 · + Undo
AL_MAKHA_CTR			ANW2		•	Minimum 300	Maximum 330

1.0 RF Plan

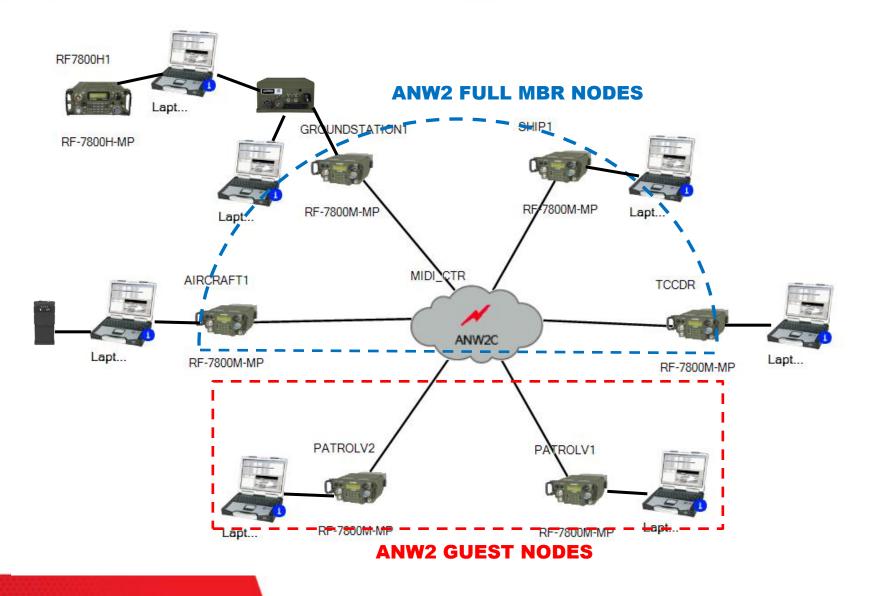


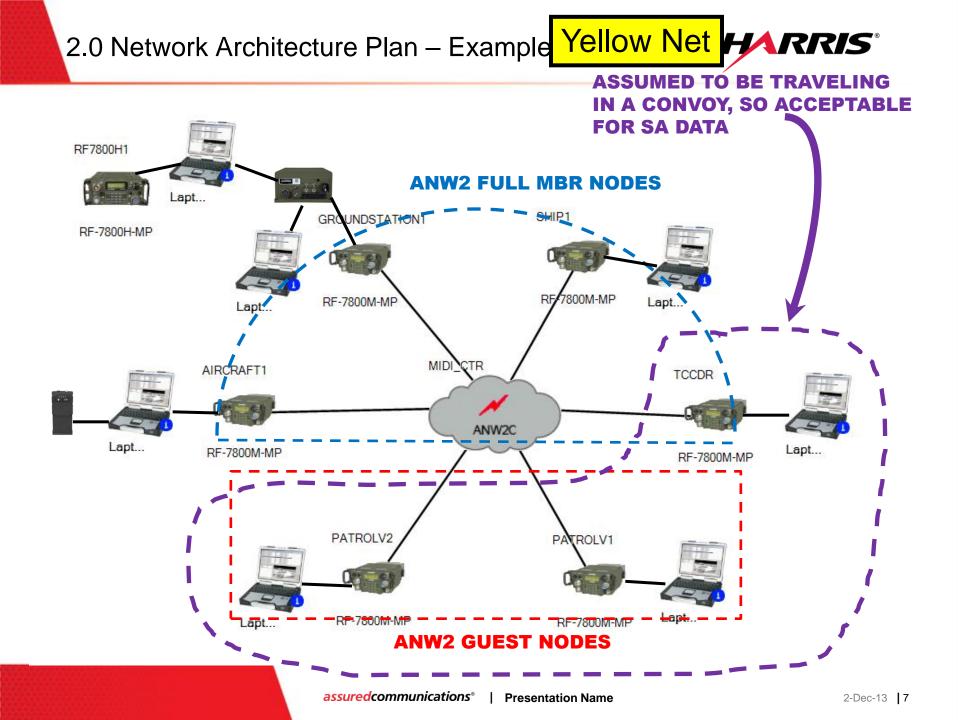
- To enable joint operations between stations or other assets and maximum flexibility, all radios are • programmed with these presets
- Yellow nets in table below have 4 dedicated full member nodes with all others on the quest list • (serial numbers will have to be tracked and sent to appropriate station or asset group)
- Every radio is capable of full membership on blue nets (issues possible if greater than 4 nodes in • an unstable network – e.g. aircraft nodes drops link and ends up reconnecting as a guest)

3	NET NAME	CHANGE TO:	IP	MASK	F(MHz)		CONOPS EXAMPLE:				
4	1ACDATA	MIDI_CTR	172.16.1.0	255.255.255.0	225.6	ANW2	1				
5	2ACDATA	JOINT_OPS1	172.16.2.0	255.255.255.0	461.25	ANW2	COMMANDER AT YCG HQ ADEN NEEDS GROUND FORCES				
6	3ACDATA	AL_SALIF	172.16.3.0	255.255.255.0	247.5	ANW2	NW2 FROM RAS EMRAN. HE CAN EITHER SWITCH TO PRESET 13				
7	4ACDATA	JOINT_OPS2	172.16.4.0	255.255.255.0	438.75	ANW2	NW2 AND ORDER THEM DIRECTLY OR THROUGH HIS AIRCRAFT				
8	5ACDATA	AL_HODEIDA	172.16.5.0	255.255.255.0	270	ANW2	N2 ASSET ON RAS EMRAN'S CHANNEL IF NEEDED. ALL ASSETS				
9	6ACDATA	JOINT_OPS3	172.16.6.0	255.255.255.0	416.25	ANW2	NEEDED FOR THE MISSION SWITCH TO PRESET 14 AND				
10	7ACDATA	AL_KHWK	172.16.7.0	255.255.255.0	292.5	ANW2	CONDUCT MISSION.				
11	8ACDATA	JOINT_OPS4	172.16.8.0	255.255.255.0	393.75	ANW2					
12	9ACDATA	AL_MAKHA	172.16.9.0	255.255.255.0	315	ANW2					
13	10ACDATA	JOINT_OPS5	172.16.10.0	255.255.255.0	371.25	ANW2					
14	11ACDATA	KHOR_OMRA	172.16.11.0	255.255.255.0	337.5	ANW2					
15	12ACDATA	JOINT_OPS6	172.16.12.0	255.255.255.0	348.75	ANW2					
16	13ACDATA	RAS_EMRAN	172.16.13.0	255.255.255.0	360	ANW2					
17	14ACDATA	JOINT_OPS7	172.16.14.0	255.255.255.0	326.25	ANW2					
18	15ACDATA	YCG_HQ	172.16.15.0	255.255.255.0	382.5	ANW2					
19	16ACDATA	JOINT_OPS8	172.16.16.0	255.255.255.0	303.75	ANW2					
20	17ACDATA	YCG_TC	172.16.17.0	255.255.255.0	405	ANW2					
21	18ACDATA	JOINT_OPS9	172.16.18.0	255.255.255.0	281.25	ANW2					
22	19ACDATA	NISHTUN	172.16.19.0	255.255.255.0	427.5	ANW2					
23	20ACDATA	JOINT_OPS10	172.16.20.0	255.255.255.0	258.75	ANW2					
24	21ACDATA	SPARE1	172.16.21.0	255.255.255.0	450	ANW2					
25	22ACDATA	JOINT_OPS11	172.16.22.0	255.255.255.0	236.5	ANW2					
26	23ACDATA	SPARE2	172.16.23.0	255.255.255.0	472.5	ANW2					
27	FFNET1	MEDEVAC			500	FFNET					

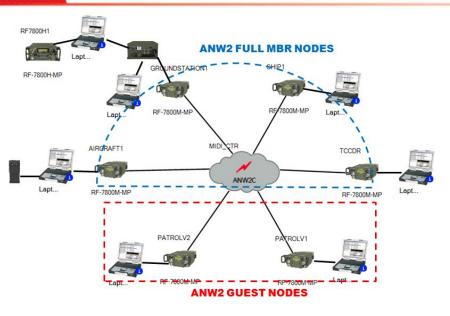
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2.0 Network Architecture Plan – Example Yellow Net





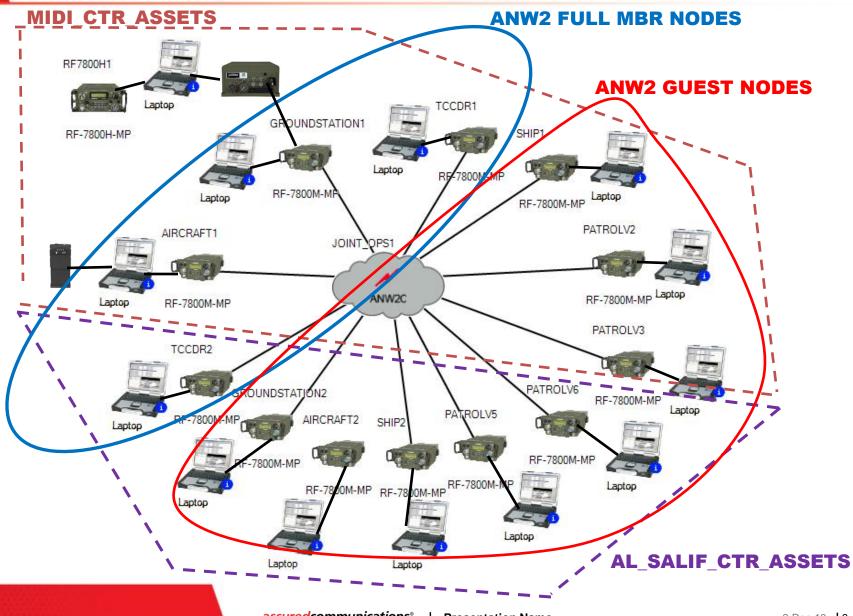
2.0 Network Architecture Plan – Example Yellow Net HARRIS



NET NAME	IP	MASK	F(MHz)		
MIDI_CTR	172.16.1.0	255.255.255.0	225.6		
	SUBNET ID	RADIO IP	LAPTOP IP	BROADCAST IP	SUBNET MASK
GS1	172.16.11.0	172.16.11.1	172.16.11.2	172.16.11.7	255.255.255.248
GSHF1		172.16.11.3	172.16.11.4		255.255.255.248
GS1MCP			172.16.11.5		255.255.255.248
AC1	172.16.11.80	172.16.11.81	172.16.11.82	172.16.11.83	255.255.255.252
SHP1	172.16.11.128	172.16.11.129	172.16.11.130	172.16.11.131	255.255.255.252
PV1	172.16.11.160	172.16.11.161	172.16.11.162	172.16.11.163	255.255.255.252
PV2	172.16.11.164	172.16.11.165	172.16.11.166	172.16.11.167	255.255.255.252
PV3	172.16.11.168	172.16.11.169	172.16.11.170	172.16.11.171	255.255.255.252
HQHF1	172.16.12.40	172.16.12.41	172.16.12.42	172.16.12.43	255.255.255.252
HQHF2	172.16.12.44	172.16.12.45	172.16.12.46	172.16.12.47	255.255.255.252
HQHF3	172.16.12.48	172.16.12.49	172.16.12.50	172.16.12.51	255.255.255.252
HQHF4	172.16.12.52	172.16.12.53	172.16.12.54	172.16.12.55	255.255.255.252
HQHF5	172.16.12.56	172.16.12.57	172.16.12.58	172.16.12.59	255.255.255.252

 Full network IP scheme:\\rfcfs02\sysprop\! Programs (WIP)\Yemen Coastal ISR 45356\High Level System Document\NETWORK_ARCH_YemenISR_REV2.xlsm

2.0 Network Architecture Plan – Example Blue Net HARRIS



2.0 Network Architecture Plan – Example Blue Net HARRIS®

- A procedure would be required at the operational level to configure this as desired
- For example:
 - 1.) Groundstation1 CDR calls Groundstation2 CDR on HF radio requesting convoy assets
 - 2.) Groundstation2 CDR acknowledges, issues warning order to TCCDR2 to switch radio nets to JOINT_OPS1, reports back to Groundstation1 CDR
 - 3.) Groundstation1 CDR instructs Aircraft1 and TCCDR1 to switch nets, tells Ship1 and Patrol Vehicle 2 and 3 to switch nets in 2 minutes
 - 4.) Groundstation1 performs a radio check, ensures all mission assets are on the net
 - 5.) After all confirmed, Groundstation2 CDR notified, his remaining assets are allowed to switch nets if desired

