



WSSH

NISN Implementation Options for KSC Deservice Pad Processing

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- 384 kbps channel for PC-GOAL interface (KSC to WSSH)
- 128 kbps channel for orbiter hardline data (WSSH to KSC)
- 17 voice circuits
 - KSC has agreed to not exceed 17 voice loops required at any time



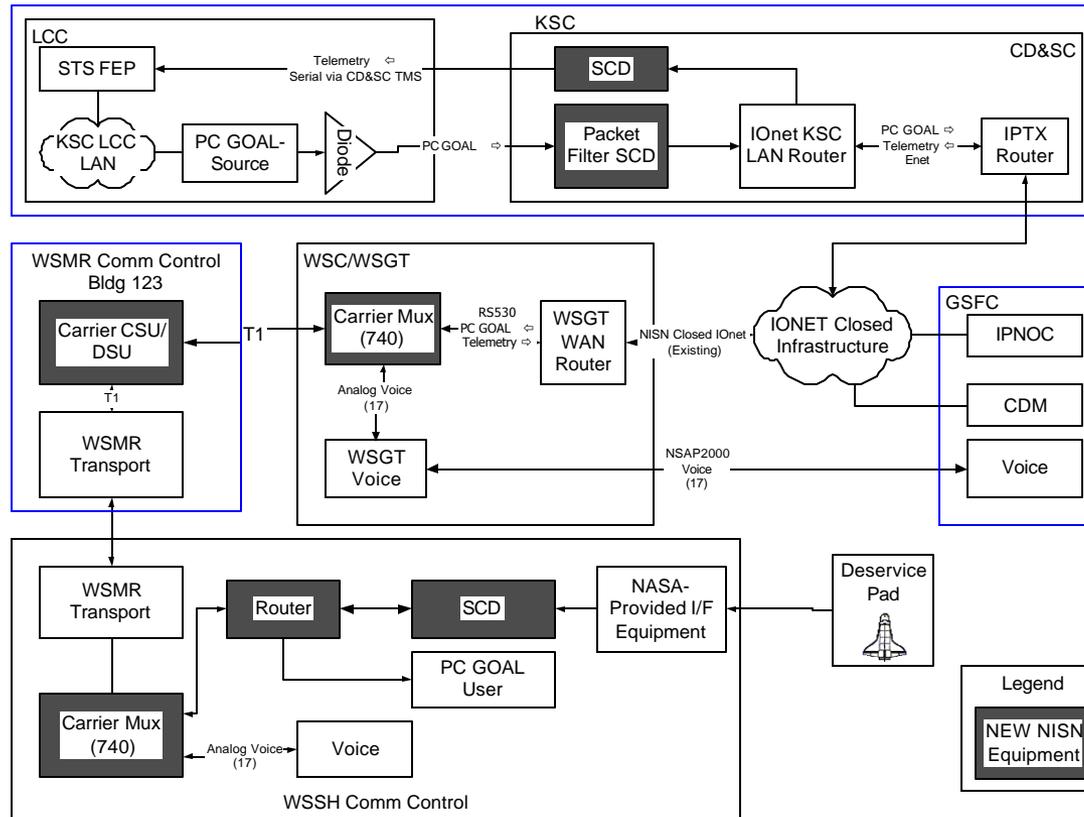
- IP End to End using Closed IOnet to transfer orbiter telemetry data from WSSH to KSC and to transfer PCGOAL data from KSC to WSSH
- Two implementation options
 - Carrier-provided mux - Option 1
 - NISN-provided mux - Option 1A

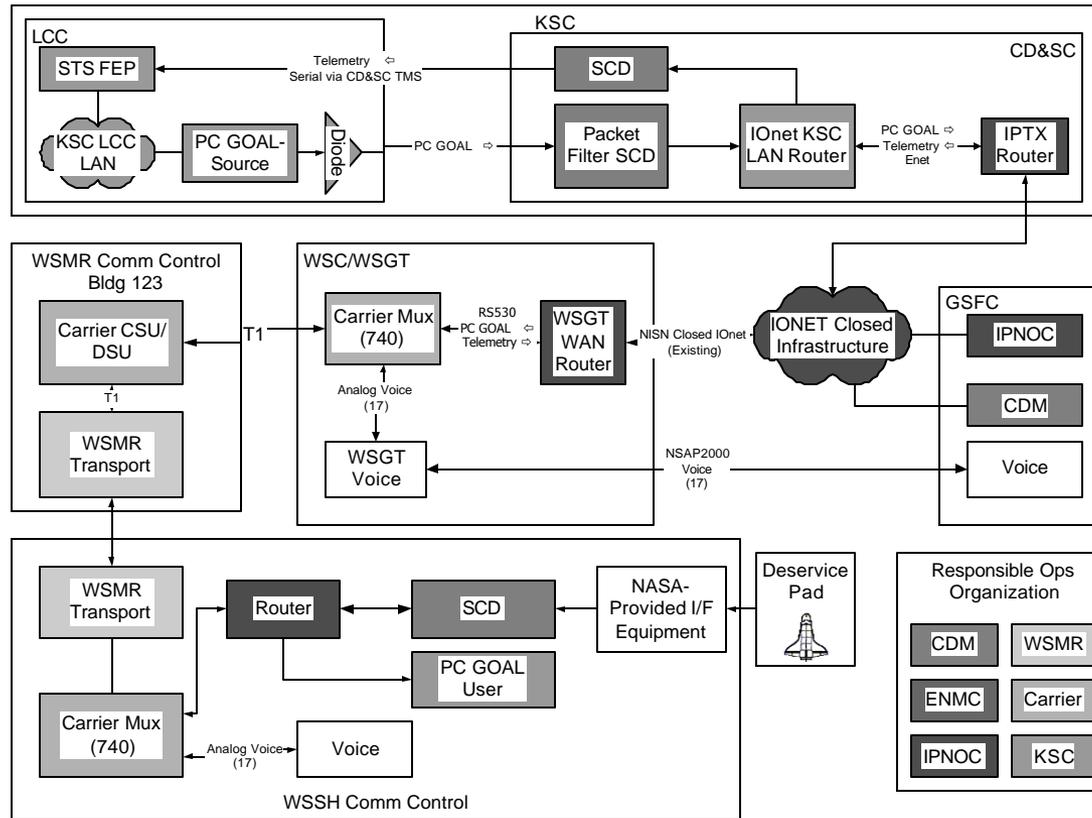


- Takes advantage of existing long-run IONET closed infrastructure between KSC and WSGT
- PC-GOAL data is IP multicast, and integrates easily into IP Transition multicast network
- Takes advantage of IONET troubleshooting capabilities
- IONET is full-duplex, and bandwidth can be shared between PC-GOAL (384kbps to WSSH) and Shuttle Orbiter Data (128kbps from WSSH).
- Existing IONET bandwidth is adequate (pending final requirements analysis).
- Allows flexibility in providing bandwidth on-demand to WSSH
- WSMR extends a single carrier T1 on-base between Building 123 and the WSSH Comm Center



- One rack of equipment
- Additional data flows would be incorporated into the WSMR-WSC T1 for network management
 - Router visibility for the IPNOC
 - Conversion device visibility for the CDM
- AT&T investigating locating mux equipment in WSSH Comm Center
 - Consistent with other NASA installations







- WSMR Responsibilities
 - Route carrier-provided T1 from Building 123 to WSSH Comm Center
- KSC Responsibilities
 - Provide PC GOAL workstation and related M&O
- WSSH Comm Center
 - On-site Support (NET Promina, router, SCD)
- NISN
 - Comm Mgr – Trouble reporting
 - Control and monitor equipment
 - Request 2 hour restoral from carrier



Data Bandwidth, includes		704
384KB PC GOAL, WSSH to KSC		
128KB HARDLINE, KSC to WSSH		
9.6KB SDL (DUPLEX)		(2)
Voice Bandwidth		496
Total Bandwidth (kbps)		1200

Note: SDL entry refers to the number of 9.6 kbps channels provided for device management and control.



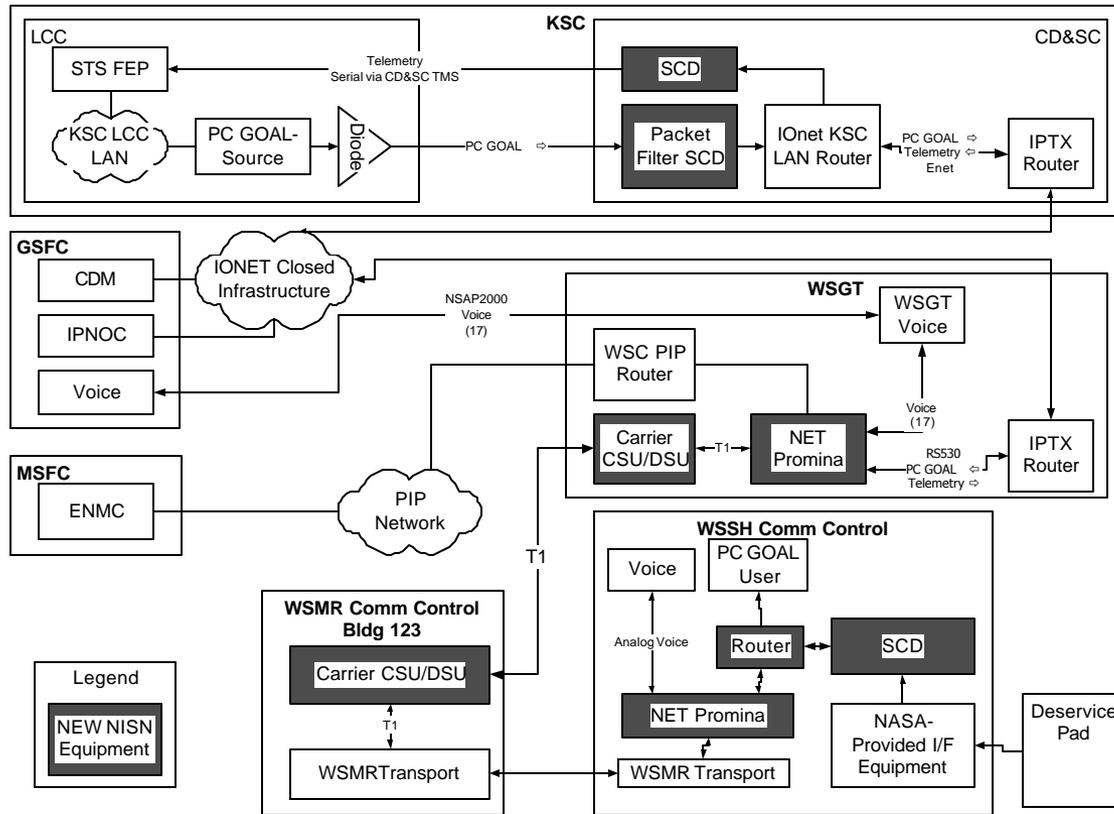
- NISN (ROM)
 - New T1 between STGT and WSMR replacing existing T1
 - \$3,500 month recurring costs
 - T1 specs: 99.85% availability and four hour restoration (intra-lata)
 - Router, SCD, AT&T installation ~\$95k (non-recurring)
- NISN Service Request (NSR) submitted for Cost Estimate
- Schedule - 120 days after notification.
 - Detailed schedule will be developed after implementation NSR assigned
- Security checklist required for both KSC and WSSH interfaces to Closed IOnet



- Advantages
 - Outsources O&M of muxes to carrier. Costs included in circuit monthly recurring costs
 - Lower Non-recurring costs
- Disadvantages Carrier Mux Option

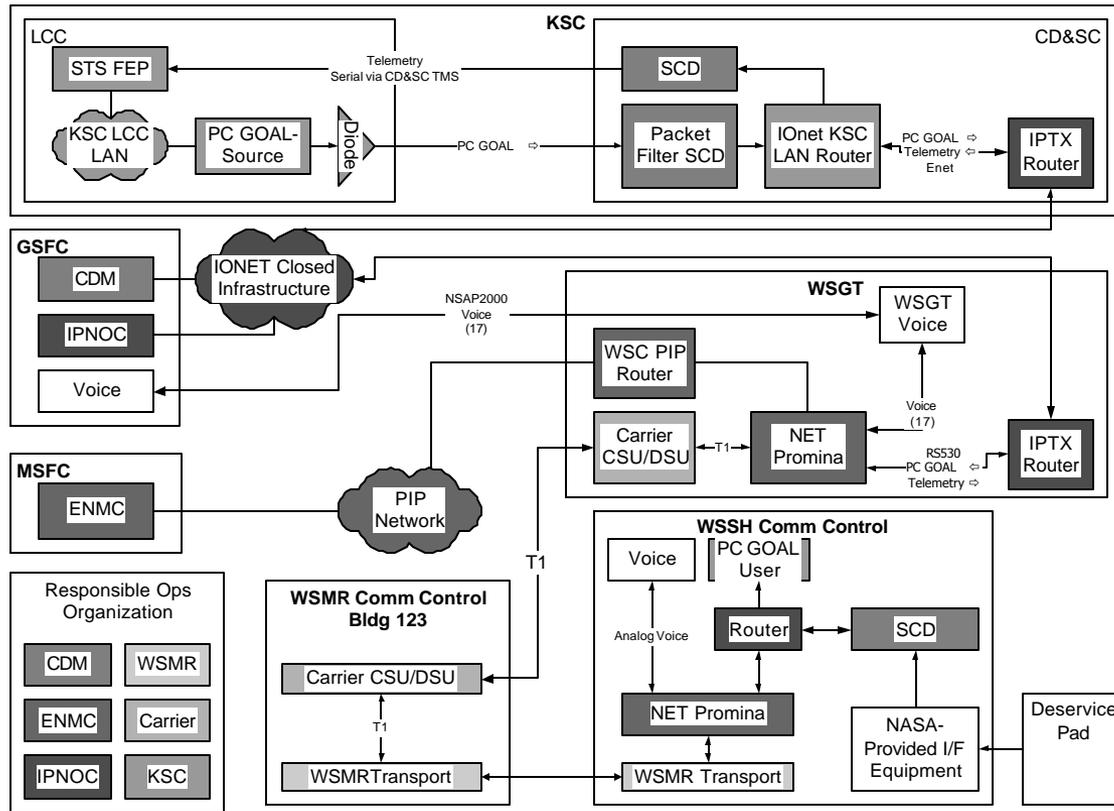


- NASA-provided mux equipment will break out data and voice channels at STGT and at WSSH Comm Center
- Three additional data flows will be incorporated into the WSMR-WSC T1 for network management
 - Router visibility for the IPNOC
 - Conversion device visibility for the CDM
 - Mux equipment visibility for the ENMC





NISN Mux Option Ops Organizations





- WSMR
 - Route carrier-provided T1 from Building 123 to WSSH Comm Center
- KSC Responsibilities
 - Provide PC GOAL workstation and related M&O
- CSOC (WSC/STGT)
 - Provide M&O for Mux equipment
- WSSH Comm Center
 - On-site Support (NET Promina, router, SCD)
- WSC
 - On-site Support (NET Promina)
- NISN
 - Comm Mgr – Trouble reporting
 - Control and monitor equipment
 - Request 2 hour restoral from carrier



Data Bandwidth, includes	704
384KB PC GOAL, WSSH to KSC	
128KB HARDLINE, KSC to WSSH	
9.6KB SDL (DUPLEX)	(3)
Voice Bandwidth	800
Total Bandwidth (kbps)	1504

Note: SDL entry refers to the number of 9.6 kbps channels provided for device management and control.



- NISN (ROM)
 - T1 between WSGT and WSMR replacing existing T1
 - \$1500/month
 - T1 specs: 99.85% availability and four hour restoration (intra-lata)
 - Router, SCD, Channel banks AT&T installation ~\$200k (Non recurring)
- Schedule - 120 days after notification.
 - Detailed schedule will be developed after implementation NSR assigned
- Security checklist required for both KSC and WSSH interfaces to Closed IOnet



- Advantages
 - ENMC has experience with the proposed mux equipment in use for Canadian Space Agency and Russian Space Agency interfaces
- Disadvantages
 - Separate NASA centers manage mux equipment (MSFC) and routers/conversion devices (GSFC), although both Control Centers respond to the Comm Manager for mission services
 - WSSH/WSMR and WSC must provide M&O for muxes
 - NASA/NISN must provide spares
 - Higher nonrecurring costs



Voice Loops



CONFERENCE NAME	KSC	JSC	GSFC	WSMR	KSC Ref.	Use	Bandwidth Option 1 (kbps)	Bandwidth Option 1A (kbps)
AIR GROUND 1	T/I	T/L	N/A	T/L		Critical Voice/MPS	32	64
AIR GROUND UHF (PRIME)	T/L	T/L	N/A	T/L		Critical Voice	32	64
AIR GROUND UHF B/U	T/L	T/L	N/A	T/L		Critical Voice	32	64
AIR GROUND VHF WX	T/L	T/L	N/A	T/L		Critical Voice	32	64
CONVOY COMMANDER	T/L	T/L	N/A	T/L		Voice/Radio	32	64
COOLING NET (VHF)	T/L	T/L	N/A	T/L		Voice/Radio	32	64
CRANE OPS UHF CONV.	T/L	T/L	N/A	T/L		Voice/LANDING FIELD PRIME 2	0	0
DDMS COORD	T/L	T/L	N/A	T/L		Voice/Radio	32	64
EPD	T/L	T/L	N/A	T/L	OIS-151	Voice/Radio	32	64
FLIGHT DIRECTOR	T/L	T/L	M	T/L		Voice/Radio/PRSD	32	64
LRD	T/L	T/L	T/L	T/L		Voice	24	16
LANDING FIELD PRIME 1	T/L	T/L	N/A	T/L	OIS-135	Voice	24	16
LANDING FIELD PRIME 2	T/L	T/L	N/A	T/L		Voice/CRANE OPS UHF CONV.	24	16
MISSION AUDIO	M	M	M	M		Voice	24	16
MISSION COMM COORD	T/L	T/L	T/L	T/L		Voice	24	16
MPS	T/L	T/L	N/A	T/L	OIS-168	Voice/AIR GROUND 1	0	0
PRSD	T/L	T/L	N/A	T/L	OIS-153	Voice/FLIGHT DIRECTOR	0	0
PURGE NET/SCAPE	T/L	T/L	N/A	T/L		Voice/Radio	32	64
SSPO	T/L	T/L	N/A	T/L		Voice (shared)	0	0
SURGEON	T/L	T/L	N/A	T/L		Voice (shared)	0	0
SITE COORD	T/L	T/L	T/L	T/L		Voice (shared)	0	0
TRACK COORD	T/L	T/L	T/L	T/L		Voice	24	16
TEST PROJ ENGR	T/L	T/L	N/A	T/L	OIS-161	Voice/Radio	32	64
Total Bandwidth							496	800

- KSC has agreed to identify sharing of voice loops to not exceed 17 at any given time. Still waiting for KSC to identify six additional circuits to be shared.(SSPO, Surgeon, Site Coord were selected to show the minimum bandwidth recovered from sharing.



- Continue pursuing the carrier-provided mux option (Option 1)
- No difference in end user functionality between the carrier mux option and the NISN mux option