



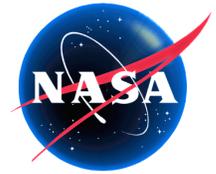
Space Network Services

GS SDR Section 8

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Ground System Engineer



Outline



- ▶ ***SN Requirements Summary***
- ▶ ***SN Architecture***
- ▶ ***Testing***
- ▶ ***Documents***
- ▶ ***Schedules***
- ▶ ***Open Items***



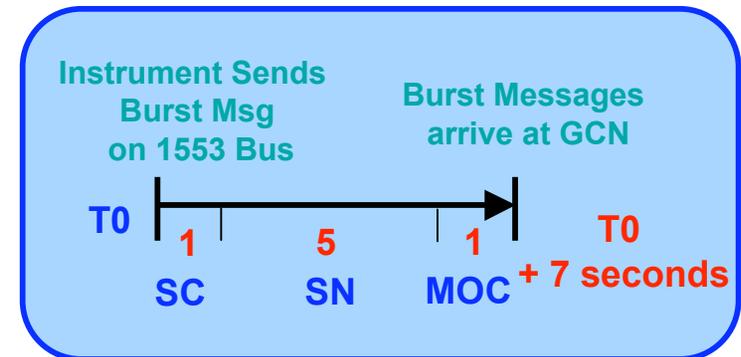
SN Requirements Summary

▶ Key SN Requirements

- Provide required MA and SSA services
- Ability to schedule an MAF service within 30 minutes for TOO commanding purposes
- Alert Processing through DAS (24x7) at 1 kbps
 - Alerts through system in 7 seconds

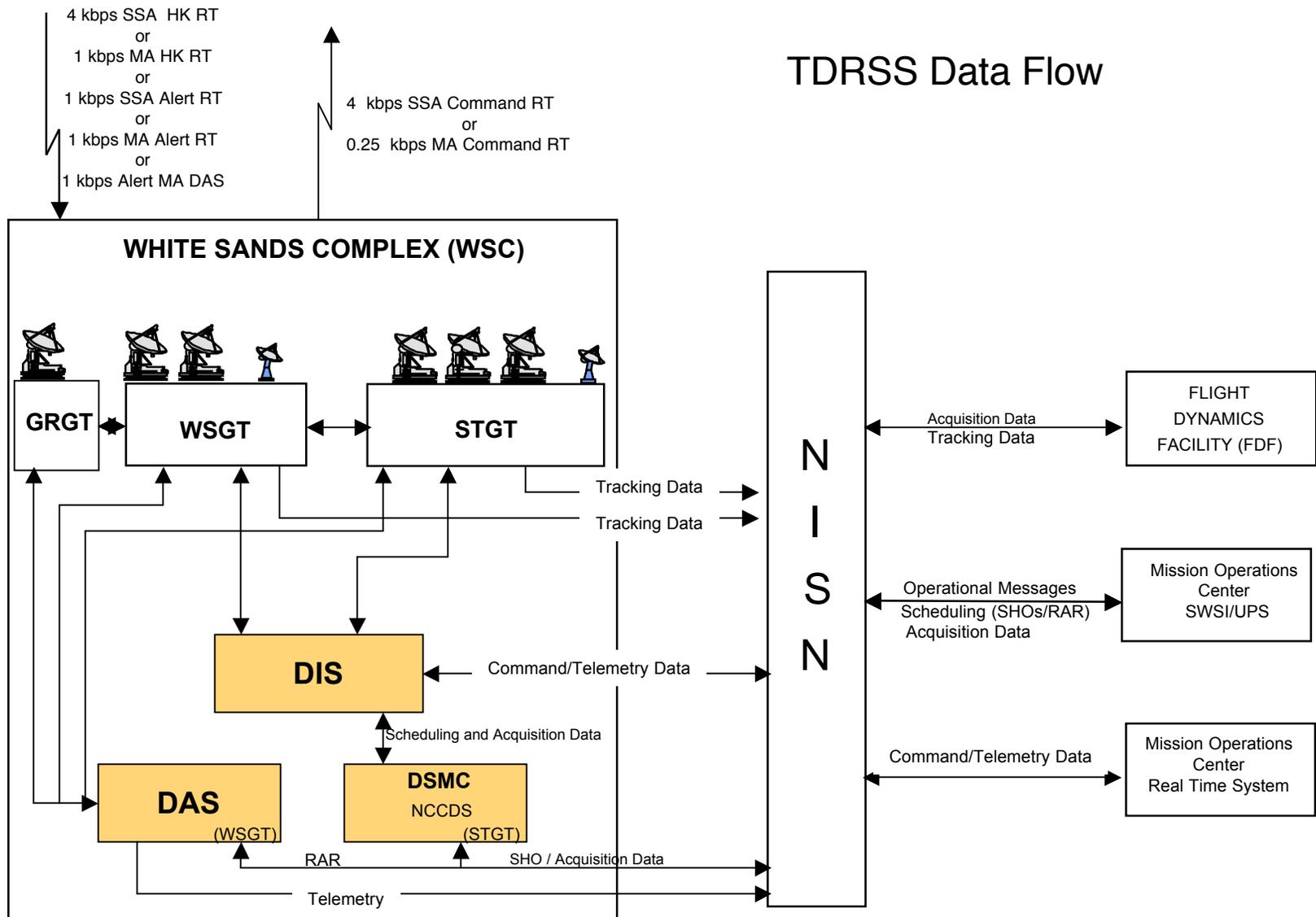
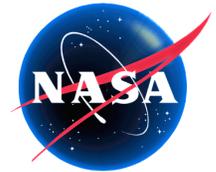
▶ SN Existing Vs New Capabilities

- Implementation of existing services





SN Architecture





SN Architecture



▶ **Link Rates**

– *Telemetry*

- 4 kbps SSA return for RT HK and Alerts during contacts
- 1 kbps MA return for RT HK and Alerts during contacts
- 1 kbps MA DAS for Non-contact Alerts
- No Recorder Playbacks

– *Command*

- 4 kbps SSA forward
- 250 bps MA forward

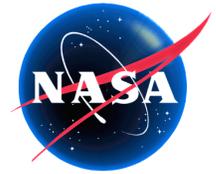
▶ **Tracking/Ranging**

– *Tracking data by Differenced One Way Doppler (DOWD)*

- *S/C Transceiver does not support two way ranging*



SN Architecture



- ▶ **Scheduling Interface**
 - *SN Web Services Interface for DAS and WDISC scheduling*
- ▶ **GFEPs**
 - *Physical Maintenance*
 - *Occasional Master Re-initialization*
- ▶ **System Features**
 - *Orbit-wide coverage from omni S-band*
 - *Possible loading conflict with other missions (e.g.,ISS)*
 - *GLAST support time requirements are not very stringent*
 - *Support provided as service from NASA*
 - *Operational messages from site during all contacts*



Testing

▶ **Compat Testing**

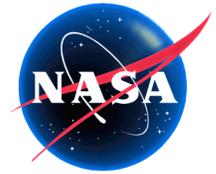
- *4-Five Day Test Mid 05 to Mid 06*
- *Verify RF Telemetry and Command Links*
- *GFEP for Ku-band Flows*
- *Use CTV for DAS and Ku-through TDRS*

▶ **GRTs**

- *7 One to Two Day tests from Early 05 Through Mid 06*
- *Verify All GSRD requirements*
- *Progressively more complex*
- *Heavy use of simulators as source but uses actual lines*

▶ **ETEs**

- *5-2 Day tests from Early 06 Through Late 06*
- *Ops Oriented Tests*
- *Spacecraft is data source*



Documents

- ▶ ***DAS to DAS Customers ICD (453-ICD-DAS/Customer)***
 - *Generic existing document applied to all users*
 - *Defines DAS guidelines/expectations*

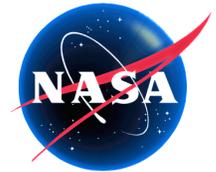
- ▶ ***ICD Between the NCC Data System and MOCs (451-ICD-NCCDS/MOC)***
 - *Generic existing document applied to all users*
 - *Defines NCC guidelines/expectations*

- ▶ ***These documents exist and GLAST will follow them***

- ▶ ***PSLA***
 - *FY04 exists*
 - *FY05 is in review*
 - *Ready by 8/30/04*



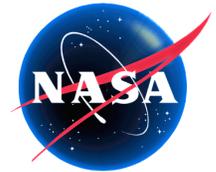
Schedule



- ▶ **All WSC Circuits in place 1/05**
 - CSR by 8/20/04
- ▶ **GFEP delivery by 4/1/05**
- ▶ **Testing commences 4/15/05**



Open Items



▶ **Burst Latency**

- *Ground System GRB Latency Allocation and Missed Latency Allocation are under review with Mission Systems*
- *An analysis is underway to substantiate that the current architecture and implementation complies with the allocation*

▶ **MA Legacy**

- *It is believed that the MA legacy system will provide superior acquisition latency performance for GRB Alerts*
- *The GLAST project is working with Code 450 to examine MA legacy in a “DAS-like” configuration.*
- *Operations will assess the impacts of this approach*