



# **Operational Support & Resource Allocations**

*GBT e2e Software Review*

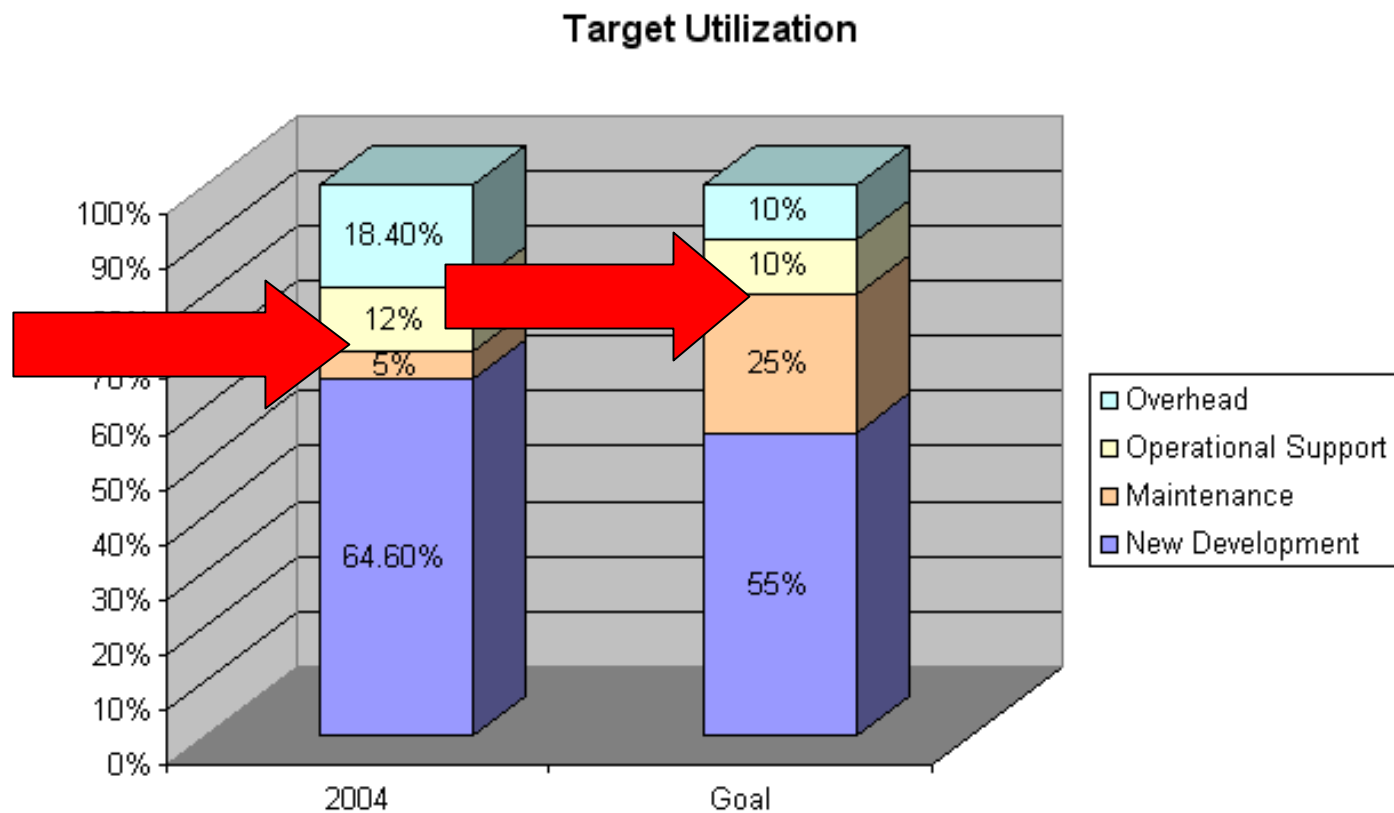
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# Resource Utilization



This presentation focuses on operational support & maintenance requirements:



# Overview



- Operational Support Includes:
  - **Emergencies**. Responding to problems that result in lost telescope time, during visiting observers' runs, commissioning, engineering tests
  - **User support**. Helping people use existing functions, learn new functionality, data reduction support
- Critical for a telescope which is currently delivering scientific capabilities!
- One of SDD's Goals for 2004 was to reduce operational support from >10% to ~10%
  - This has happened, but we must work aggressively to keep operational support requirements at this level
  - Major implication is that **we must allocate sufficient maintenance and enhancement time to prevent cascading bugs!**
  - Sufficient maintenance reduces the need for emergency operational support.
  - Improved means of tracking, managing and responding to faults also desirable



# Examples of Recent Operational Support Tasks

- Resetting various devices and managers, often associated with network and communications instabilities
- Investigation of antenna issues, including a problem with the switches that indicate wrap position and an azimuth transducer fault
- Resolving compiler issues which prevented scripts for pulsar spigot observing from being entrained into M&Cv4.5
- Errors with memory overloads in the Spectral Processor were identified as too many, too large parameters being set at once on a single board that can not cope with the load. Low-level API was improved to manage communications with the single boards more parsimoniously than managers on other platforms to prevent single board limitations from bringing down the system until all managers are ported to Linux.
- Spectral processor self test not producing output files
- Helping users test out expert level of new Observing API

# Change Control Board



- Project Planning Committee deals with work activities on a high level, but does not focus on specific technical details of solving problems
- One aspect of our “continuous optimization” of operational support time is to more carefully review, at a technical level, multi-disciplinary changes in software, electronics, operations, or operational procedures
- A Change Control Board is being formed, designed to mitigate risks associated with these types of changes
- Group will start meeting in Fall 2004, full ramp-up by early 2005
- One of the first goals will be to **work through the backlog of bug reports** and enhancement requests, many of which involve software (~300 items)
- Working out conflicts together, and in advance, will:
  - Save development time
  - Reduce/eliminate need for rework

# Quality Diagnostics



- Focuses on the problems that can arise during observing which have an impact on the production or capture of data according to scientific intent.
- Project to be worked by co-op student (R. DuPlain), 6/04 – 9/05

## Goals:

- Recover more quickly from lost telescope time by identifying root causes of problems more efficiently, and in an automated fashion.
- Solve root cause problems instead of simply correcting symptoms.
- Allocate scarce development resources more effectively.
- Lend objectivity to our assessments of software downtime, which will help with prioritization of fixes.
- Produce quality information to store in the NRAO Archive with data produced by observing runs.

# Resource Utilization



- 2 Astronomers
  - But less than 1 FTE due to overhead and operational support requirements – all focused on Data Handling project
- 8 Software Engineers
  - ~6.4 FTEs after overhead and operational support are considered
  - Typically 2-3 FTEs to PTCS,
  - 2 to Ease of Use
  - 1 to Data
  - 1 to Maintenance
- **Net Effect: Projects move SLOWLY.**
- 1 co-op student, working on data quality diagnostics
- Continue to be severely limited by scientific staff effort availability as well!

***Many e2e priorities are not yet on the critical path for GBT's scientific development. Tasks must be selected parsimoniously, with great attention to the critical path, because resources are spread very thinly.***