JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM
SFB: 366-91-2
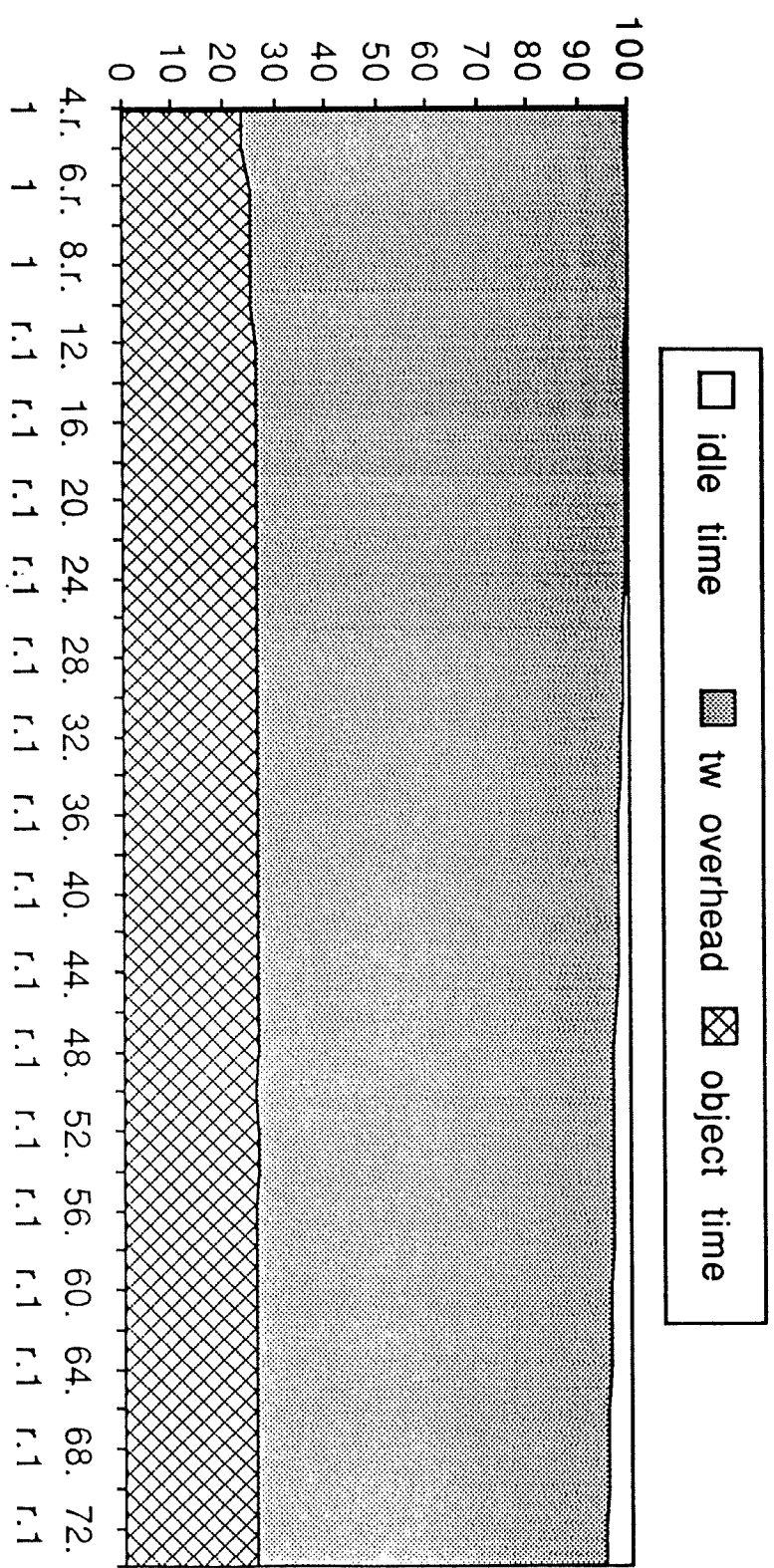July 2, 1991

TO: Time Warp Group
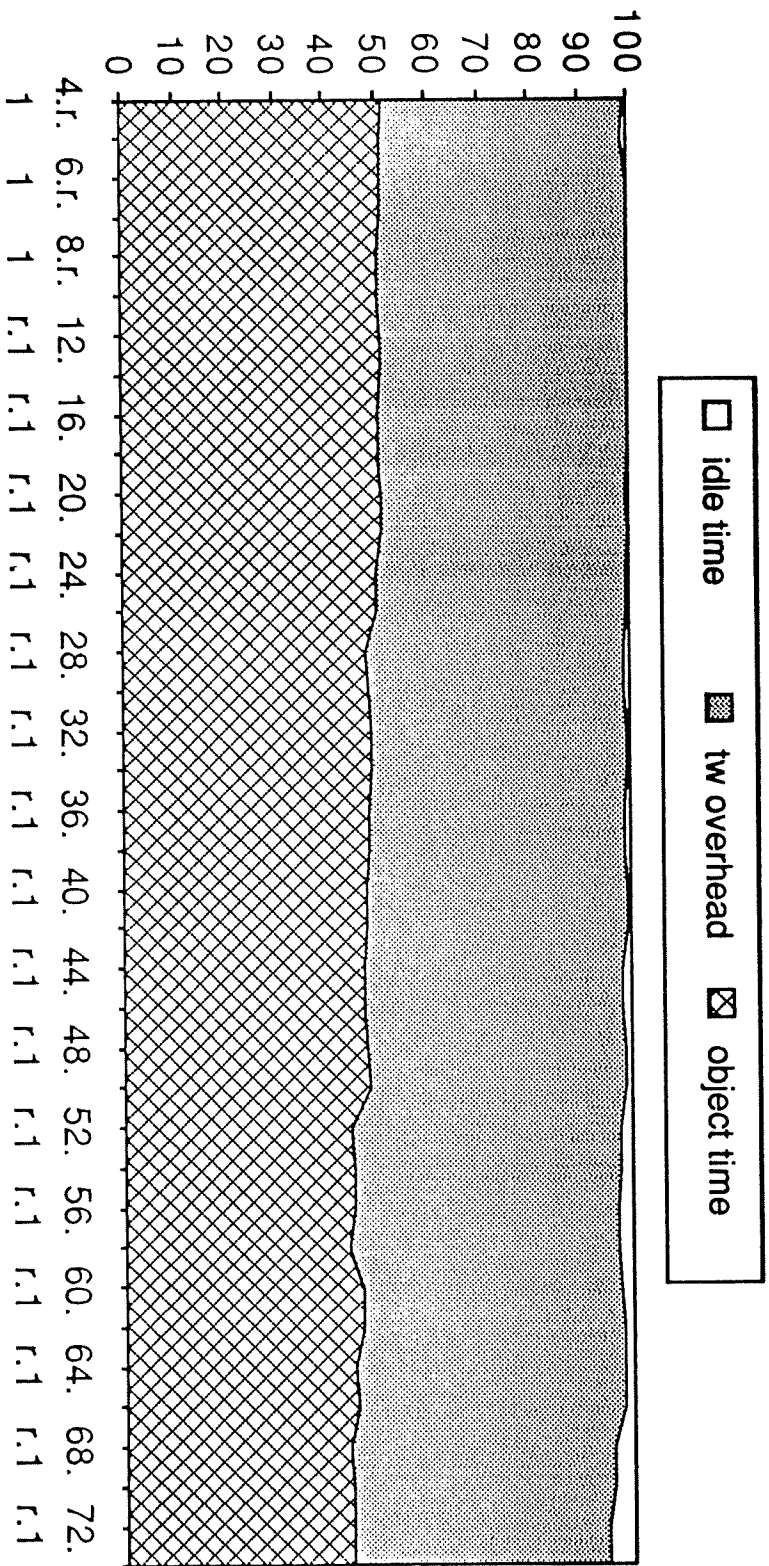
FROM: Steve Bellenot

SUBJECT: in my idle time.

The following data was collected while obtaining the idle time data for Figure 1 of my paper "State skipping performance with the Time Warp Operating System." The data shows the overall percentage of time spent in object code, while idle and while doing anything else (TW overhead).

For each of Pucks, STB88 and Warpnet a collection of time measurements were made. At every GVT update, each node stored the number of idle ticks, the number of object ticks and the number of total ticks using the qlog code. The first and last set of data were removed (first and last GVT) and the rest was averaged. For each number of nodes there were two runs and all the data is plotted. (The data was labeled 4.r.1, 4.r.2, 6.r.1, ...; hence the strange labeling of the x-axis in the graphs.)
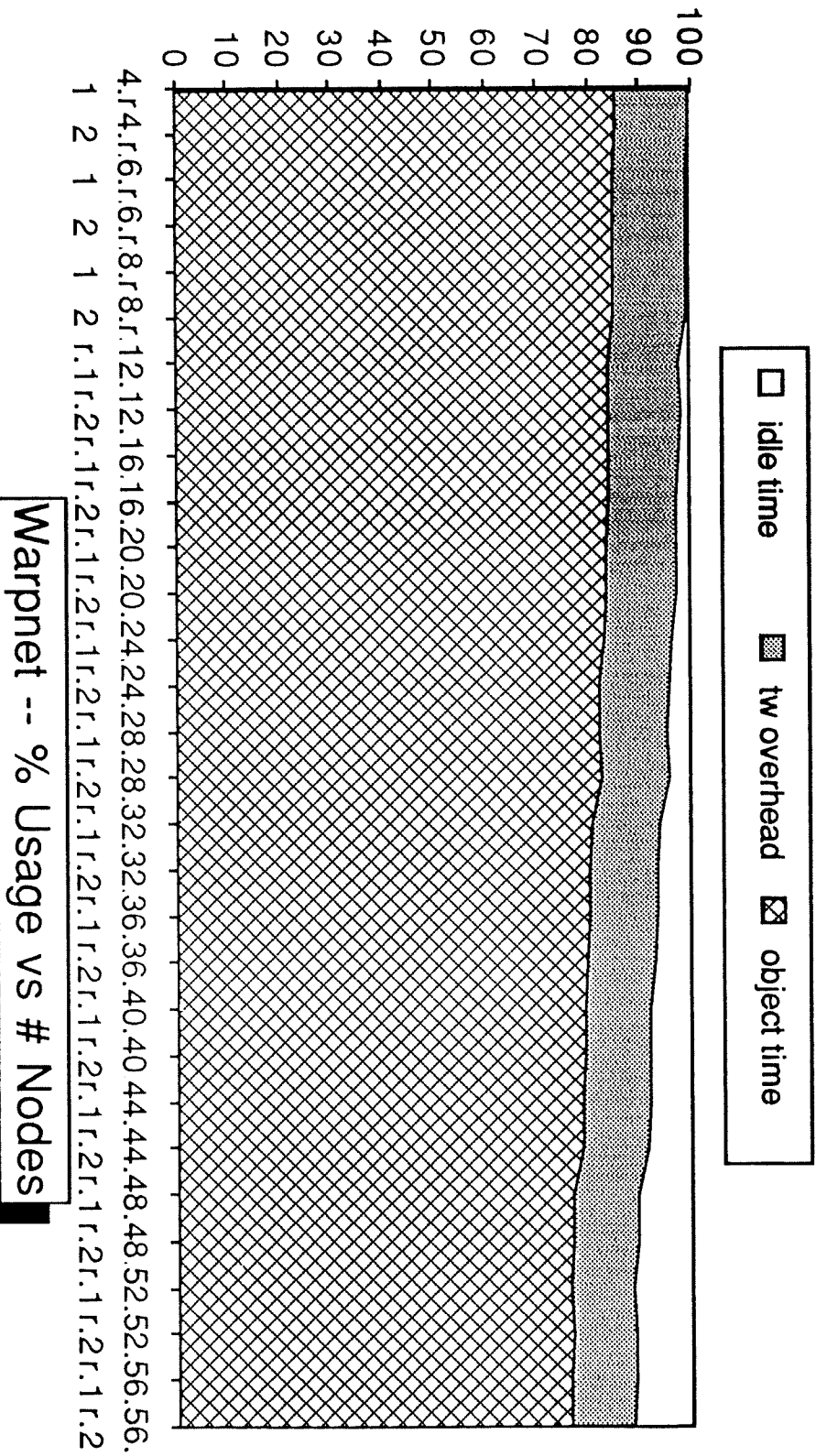
David Jefferson observed that the differences in the graphs can be explained in terms of granularity. Time Warp overhead per event is roughly 8 milliseconds. The granularity of Pucks is about 3 milliseconds per event. The granularity of STB88 is about 8 milliseconds per event. The granularity of Warpnet is about 50 milliseconds.

Pucks--% Usage vs # Nodes

idle time tw overhead object time

100 90 80 70 60 50 40 30 20 10 0

4.r. 6.r. 8.r. 12. 16. 20. 24. 28. 32. 36. 40. 44. 48. 52. 56. 60. 64. 68. 72.
1 1 r.1 r.1 r.1 r.1 r.1 r.1 r.1 r.1 r.1 r.1 r.1 r.1 r.1 r.1 r.1 r.1 r.1

STB88- % Usage vs # Nodes

idle time   tw overhead   object time

Warpnet -- % Usage vs # Nodes

Legend:
- □ idle time
- ▦ tw overhead
- ▨ object time

Y-axis: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

X-axis: 4.r.4.r.6.r.6.r.8.r.8.r.12.12.16.16.20.20.24.24.28.28.32.32.36.36.40.40.44.44.48.48.52.52.56.56.

1 2 1 2 1 2 1 2 1 2 r.1 r.2 r.1 r.2 r.1 r.2 r.1 r.2 r.1 r.2 r.1 r.2 r.1 r.2 r.1 r.2 r.1 r.2 r.1 r.2