

# Chapter 63 - Performance Work On A Real Port

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Performance work on a large IE port is measurement work. Guessing is not enough when one frame can involve game code, matrix work, texture streams, Voodoo command submission, audio voice writes, file activity, and input.

## 63.1 Count The Frame

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The case-study port records counters for the work that matters:

Counter family	What it answers
Triangles and texture rectangles	How much picture work reached Voodoo
Draw calls	How often the drawing contract was invoked
MMIO writes	How much register traffic the frame generated
Command submits and pairs	How much work moved through Voodoo streams
Texture stream bytes	How much texture data crossed into Voodoo
Audio voice writes	How much audio control traffic was emitted
Clipped triangles	How much graphics work was rejected before drawing

These are not decorative numbers. They tell you whether a change moved work out of the hot path or merely moved it somewhere harder to see.

## 63.2 Compare Like With Like

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Frame-rate readings are useful only when the scene, frame group, and instrumentation are known. A short race scene, a title screen, and a blank smoke frame do not measure the same thing.

The case-study notes use groups of frames rather than single-frame claims. That makes changes such as command streams, texture upload paths, audio shadowing, and coprocessor batching visible.

## 63.3 Reduce Traffic, Not Meaning

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Several optimisations preserve the same visible behaviour:

- Keep texture copies in high RAM and stream them when selected.
- Submit Voodoo register writes through a command stream.
- Avoid rewriting unchanged audio voice fields.
- Batch transform and lighting work.
- Measure MMIO volume before and after each change.

The work is still the same game frame. The bus traffic is cleaner.

## 63.4 The General IE Lesson

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Profile the contract, not your hopes. Count triangles, bytes, MMIO writes, voice updates, command pairs, and frame groups. Then optimise the path that the counters prove is hot.