

# Ultra 3 SCSI

performance and comparisons

**Andrew Wilson**





# Outline

- ∪ **Philosophy of Models**
- ∪ **Workload Parameters**
- ∪ **Year 2000 Model parameters**
- ∪ **Ultra 2 and 3 Comparisons**



# Philosophy

*Ideal Hosts assumed (CPU utilization, MP locks, PCI bandwidth ignored and software latency ignored)*

*Workloads based on trace data where available or expert opinion where not.*

*Spread sheet uses closed queuing model for bus / loop contention*

*Disk drive parameters use extrapolations from measured and published data*

*Assumes LUN Bridges for greater than 15 devices*

# Workload Parameters

*Average Request sizes, Write Fraction, Sequential Fraction and Array Cache Hit Ratio*

	<i>Read Size</i>	<i>Write Size</i>	<i>Write Fraction</i>	<i>Seq. Fraction</i>	<i>Hit Ratio</i>
<i>A</i>	<i>256 KB</i>	<i>N/A</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>
<i>B</i>	<i>4 KB</i>	<i>6 KB</i>	<i>0.3</i>	<i>0.0</i>	<i>0.0</i>
<i>C</i>	<i>4 KB</i>	<i>1.5 KB</i>	<i>0.65</i>	<i>0.5</i>	<i>0.0</i>
<i>D</i>	<i>4 KB</i>	<i>6 KB</i>	<i>0.3</i>	<i>0.2</i>	<i>0.0</i>
<i>E</i>	<i>4 KB</i>	<i>6 KB</i>	<i>0.3</i>	<i>0.2</i>	<i>0.75</i>
<i>F</i>	<i>4 KB</i>	<i>0.6 KB</i>	<i>0.86</i>	<i>0.84</i>	<i>0.75</i>

# Year 2000 Parameters

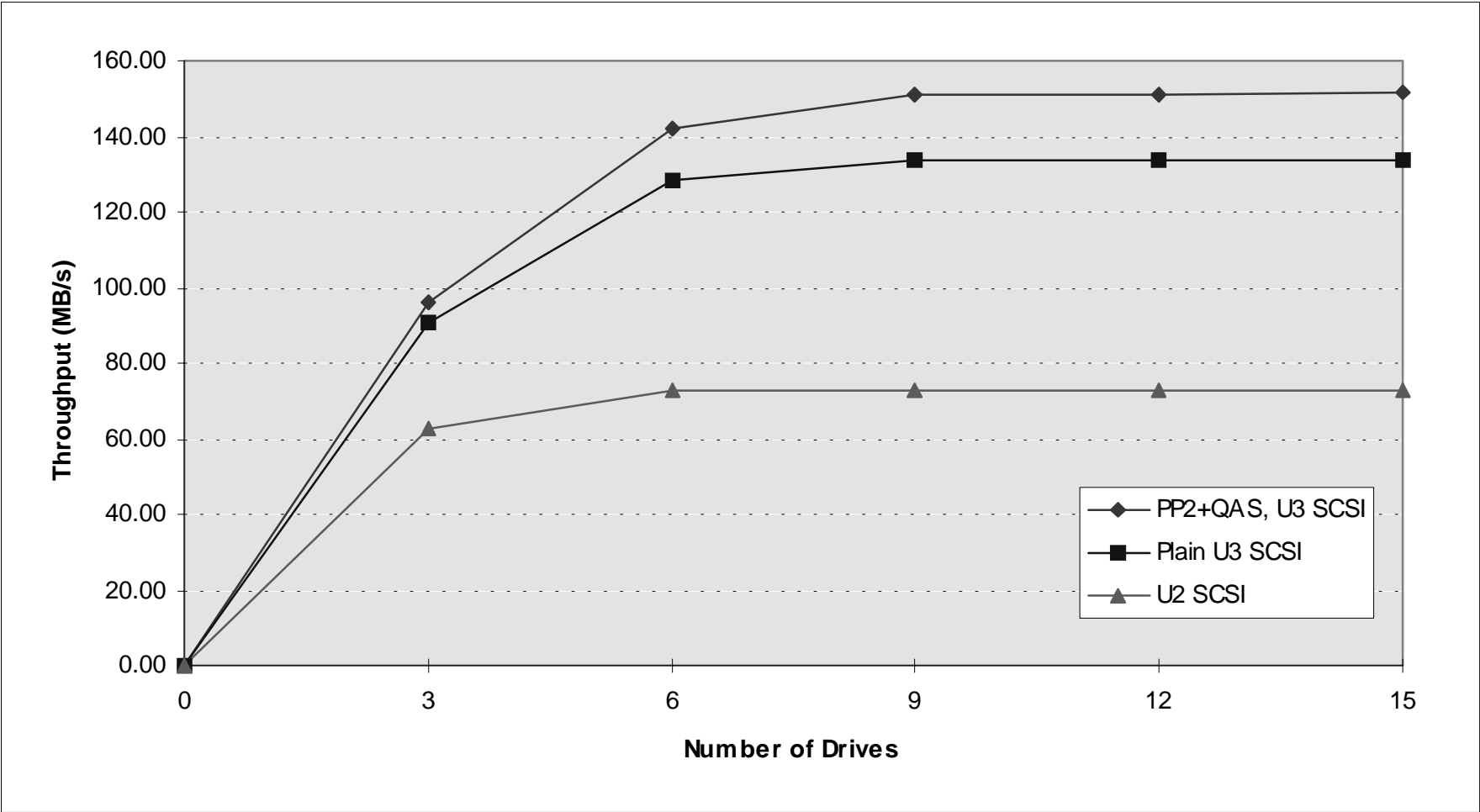
*Drives extrapolated by 3 years*

- ∪ **36 MB/s Sustained Sequential**
- ∪ **2.00 ms rotation, 3.4 & 4.4 ms seek**

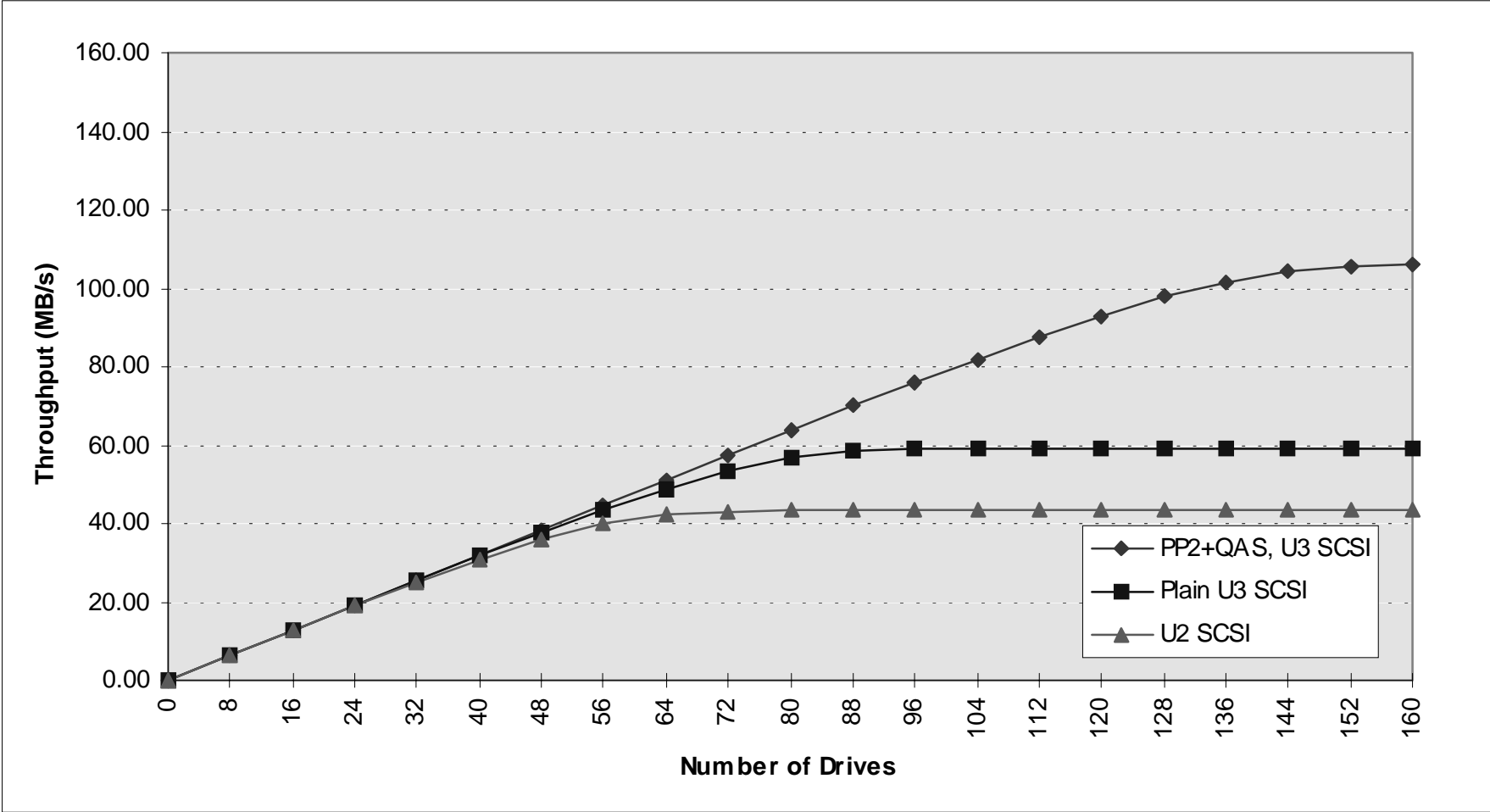
*U-3 SCSI set at 3x ideal (with and without enhancements)*

- ∪ **160 MB/s burst rate**
- ∪ **9 - 29  $\mu$ s basic overhead per command**
- ∪ **6 - 20  $\mu$ s for seek disconnect**
- ∪ **6 - 22  $\mu$ s for data disconnect**

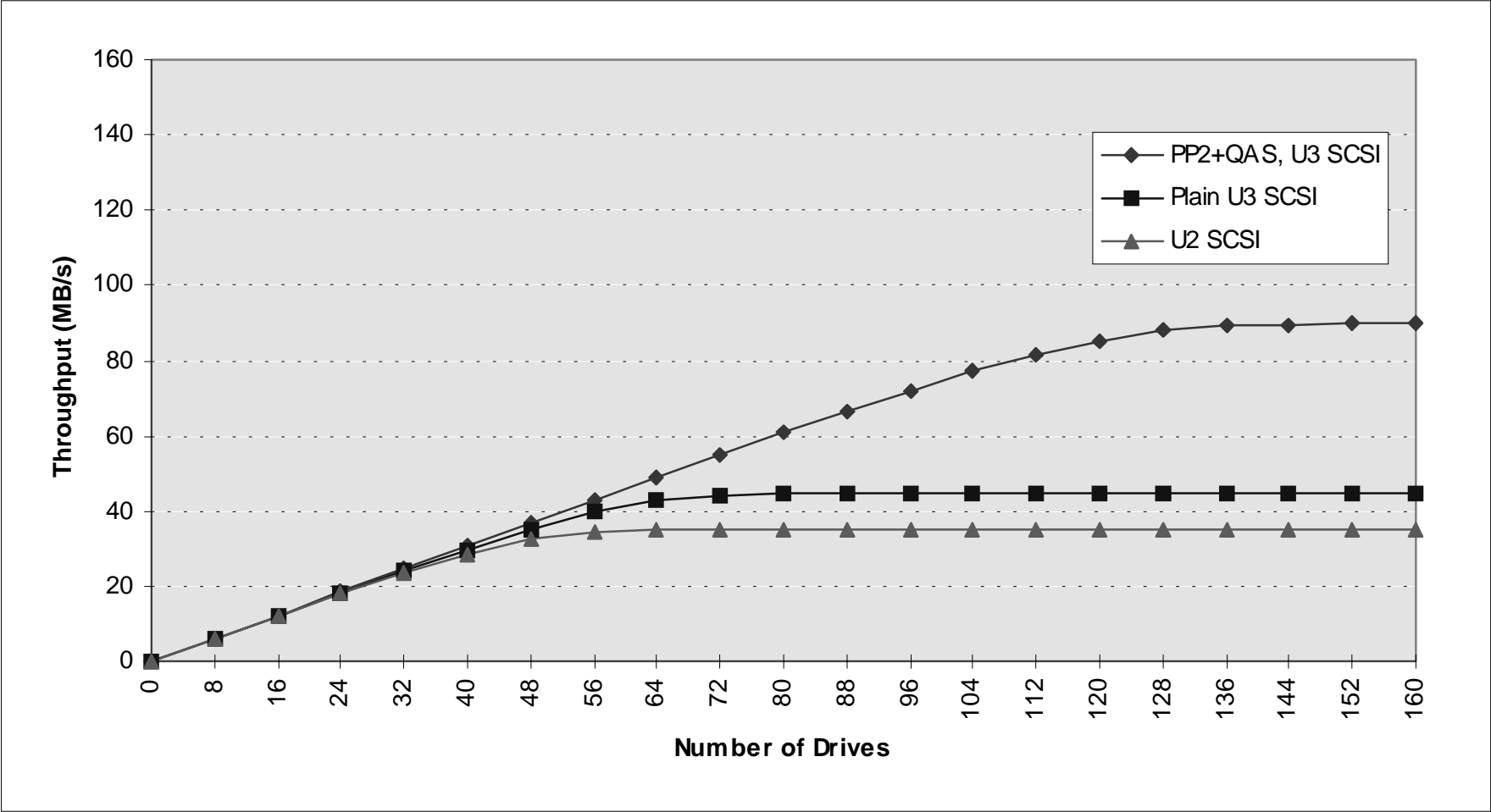
# Workload A



# Workload B

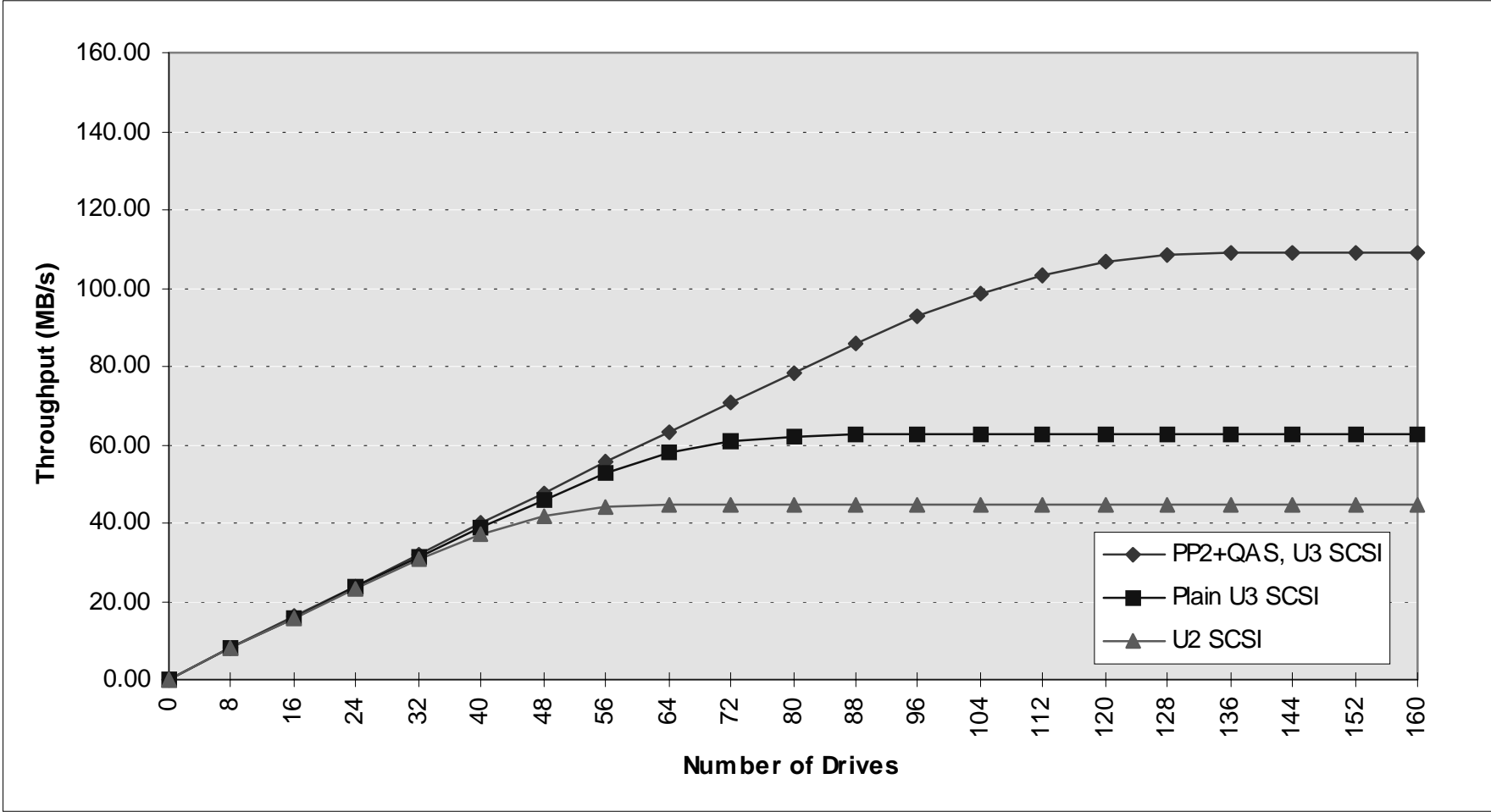


# Workload C

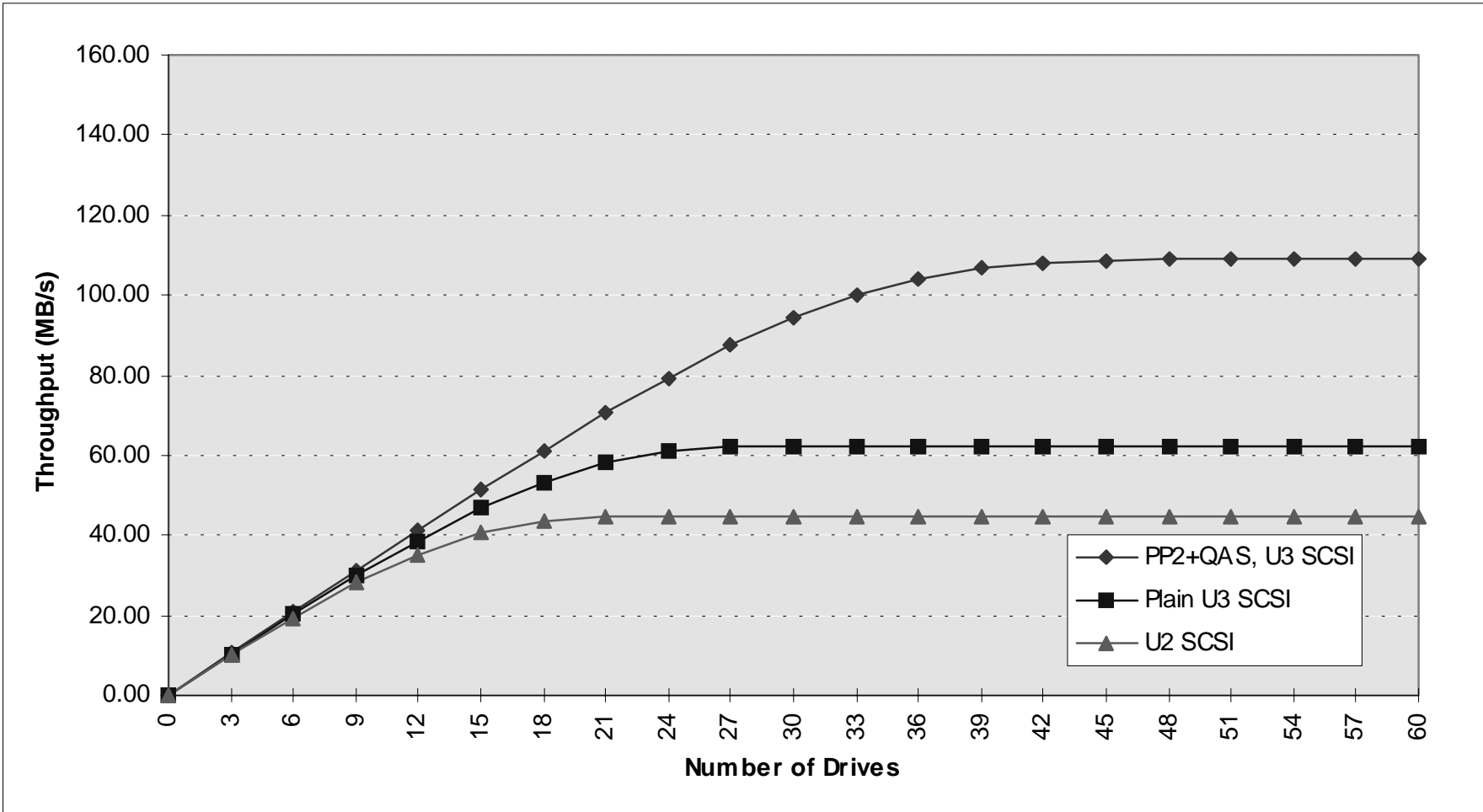




# Workload D



# Workload E



# Workload F

