Passport Advantage Software

- PVU Licensing for System z10 IFLs

February, 2008

Information as of February 26, 2008. Refer to link on page 9 for most current information

Notice

This presentation includes customer consolidation examples which are based on relative processor core performance estimates. While these estimates are calculated by IBM using internal performance benchmarks, actual performance may vary based on each customer's unique server configuration and workload, among other factors.
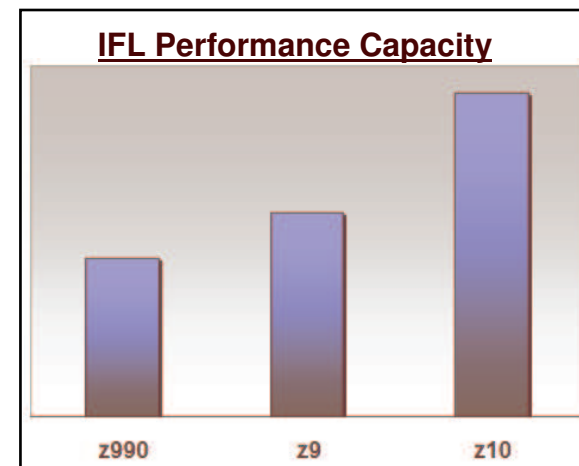
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Agenda

- z10 Integrated Facility for Linux (IFL) Highlights

- Price / Performance Comparison

- PVU Table

- z10 Processor Chip Architecture

- PVU Licensing for IBM System z10 IFL Summary

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z10 Integrated Facility for Linux (IFL) Highlights

- z10 hardware technology is the next generation of the System z server technology replacing z9 and z990

IFL Performance Capacity

- Up to 60% performance capacity increase over z9 technology
  - ▸ Up to 100% increase over z990
  - ▸ Fewer IFLs needed for equivalent workload

- Processor Value Unit (PVU) Licensing for Passport Advantage middleware on IFLs
  - ▸ Each z10 IFL requires 120 PVUs
    - Same PVU requirement as for IBM POWER6 processor cores
  - ▸ z9 and prior hardware continues to require 100 PVUs

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Price / Performance Comparison*

- Assuming Equivalent Software Workload:

z990 IFL		
System z990	PVUs per IFL	PVU Licenses Required
32 IFLs	100	3,200

Vs.

z10 IFL		
System z10	PVUs per IFL	PVU Licenses Required
16 IFLs	120	1,920

% Software Price / Performance Advantage: **+40%**
(equivalent workload)

PVUs required for same workload:
- ✓ z10 = 1920 PVUs
- ✓ z990 = 3200 PVUs

z10 has 40% SW price/performance advantage over z990

z9 IFL		
System z9	PVUs per IFL	PVU Licenses Required
26 IFLs	100	2,600

Vs.

z10 IFL		
System z10	PVUs per IFL	PVU Licenses Required
16 IFLs	120	1,920

% Software Price / Performance Advantage: **+26%**
(equivalent workload)

PVUs required for same workload:
- ✓ z10 = 1920 PVUs
- ✓ z9 = 2600 PVUs

z10 has 26% SW price/performance advantage over z9

*Estimates based on IBM Internal Benchmarks

PVU Table

Table of Processor Value Units (PVUs) per Core[1]

Processor[2] Families		Processor Type						PVUs *per* Processor Core
Vendor	Brand	One-Core (1)	Dual-Core (2)	Quad-Core (4)	Hexa-Core (6)	Octi-Core (8)	IFL Engine	
IBM	POWER6		■					120
IBM	System z10						■[3]	120
IBM	POWER5		■					100
IBM	System z9, z990, S/390[4]						■[3]	100
Fujitsu	SPARC64 VI		■					100
HP	PA-RISC		■					100
Intel®	Itanium®		■					100
Sun	UltraSPARC IV		■					100
Any	Any single core	■						100
IBM	PowerPC 970		■					50
IBM	POWER5 QCM			■				50
AMD	Opteron		■	■				50
Intel®	Xeon®		■	■				50
Sun	UltraSPARC T2				■	■	■	50
IBM	Cell/B.E.™	■[5]						30
Sun	UltraSPARC T1			■	■	■		30

NEW

4 Tiers

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Notes:

[3] **Each IFL or CP engine is equivalent to 1 processor core.**

[4] **Refers to System z9, eServer zSeries, or System/390 servers.**

▸ Processor Value Unit Table

PVU website

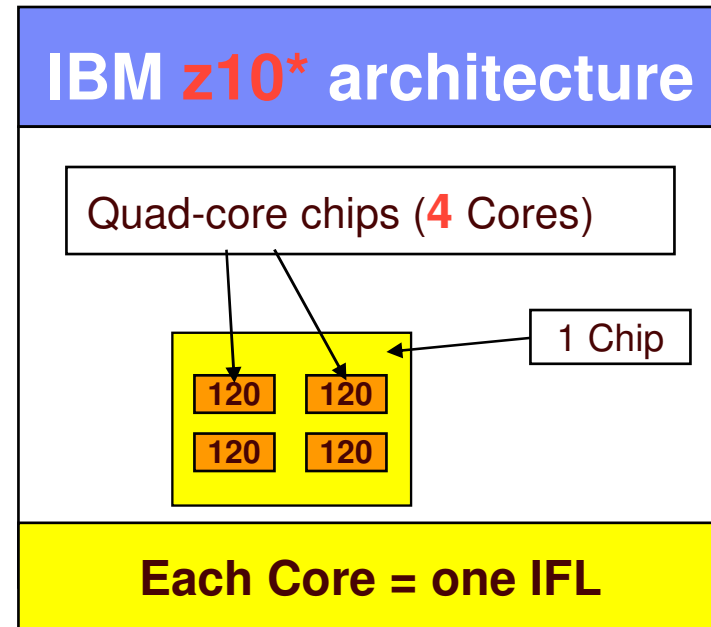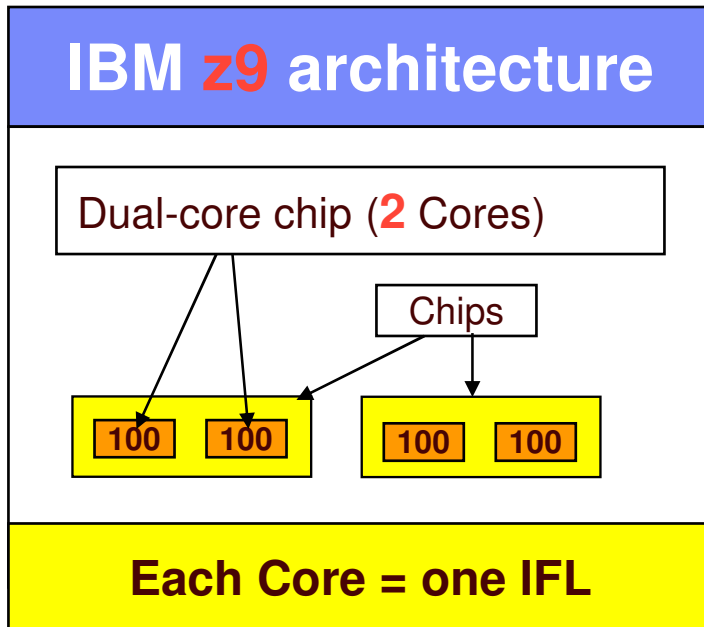Link: http://www-306.ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html

IFL = Engine = Core

- The IBM System z10 has quad-core processor chips (4 cores per chip)
  - ▸ The System z9 has dual-core processor chips (2 cores per chip)

- PPA Software continues to be licensed per PVU, which is determined by number of IFLs (i.e. core)

IBM z9 architecture
Dual-core chip (**2** Cores)
Chips
100 100   100 100
Each Core = one IFL

IBM z10* architecture
Quad-core chips (**4** Cores)
1 Chip
120 120 120 120
Each Core = one IFL

*Each IFL requires 120 PVUs for software licensed on a PVU basis (480 PVUs for all 4 engines on a quad-core processor chip)

PVU Licensing for IBM System z10 IFL Summary

- **Realize the Value of Software on a Superior Performer**
  - ▸ z10 performance per IFL is significantly higher than z9 and z990
  - ▸ Handles more workload with same number of IFL Engines, and/or
  - ▸ Runs equivalent workload with fewer IFL Engines

- **120 PVU's per IFL (IFL = one <u>Core</u>)**
  - ▸ PVU requirement reflects superior value
  - ▸ Provides significantly improved software price / performance
  - ▸ Apply existing PVU licenses toward z10 migration
    - ▪ Only purchase additional PVUs if current entitlements are insufficient

- **Substantial Customer Savings**
  - ▸ On new workload growth
  - ▸ Consolidation from competitor technology

PVU licensing customer link: PVU website

http://www-306.ibm.com/software/lotus/passportadvantage/pvu_licensing_for_customers.html