EPL Data Conversion System PATACON PC-Cluster for EPL

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3. EPL data conversion system
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5. Summary

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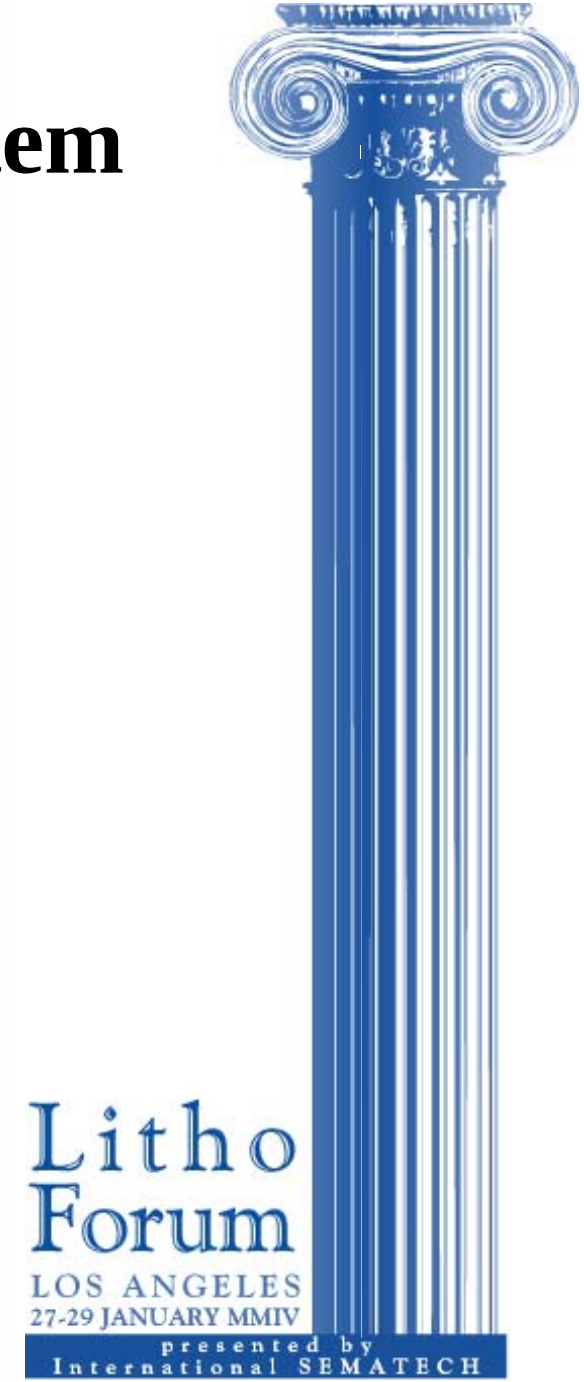

1. Introduction of PATACON

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CAD data
- GDS-II

EB data
- MEBES(*1)
- MEBES mode5(*1)
- JEOL52
- JEOL52V1.1
- JEOL52V2.1
- JEOL52V3.0
- JEOL52V3.1
- HL-700
- HL-800
- HL-900
- HL-7000
- EBM(*2)
- BEF-2(Advantest)(*2)

Inspection data
- LM-7000

→

Fracturing treatment
- Mirror
- Rotate
- Scale
- Boolean operation
- Resizing
- Pattern fracturing
- Small-figure treatment
- Format conversion
- Proximity effect correction
- Extraction of aperture pattern for cell projection exposure

Graphic display
- Pattern
- Job file

→

EB data
- MEBES(*1)
- MEBES mode5(*1)
- JEOL52
- JEOL52V1.1
- JEOL52V2.1
- JEOL52V3.0
- JEOL52V3.1
- HL-700
- HL-800
- HL-900
- HL-7000
- EBM(*2)
- BEF-2(Advantest)(*2)

Inspection data
- LM-7000

→

Graphic display

*1 Data format cannot be converted from MEBES to other EB format.
*2 We have a plan to support this format.

2. PATACON PC-cluster

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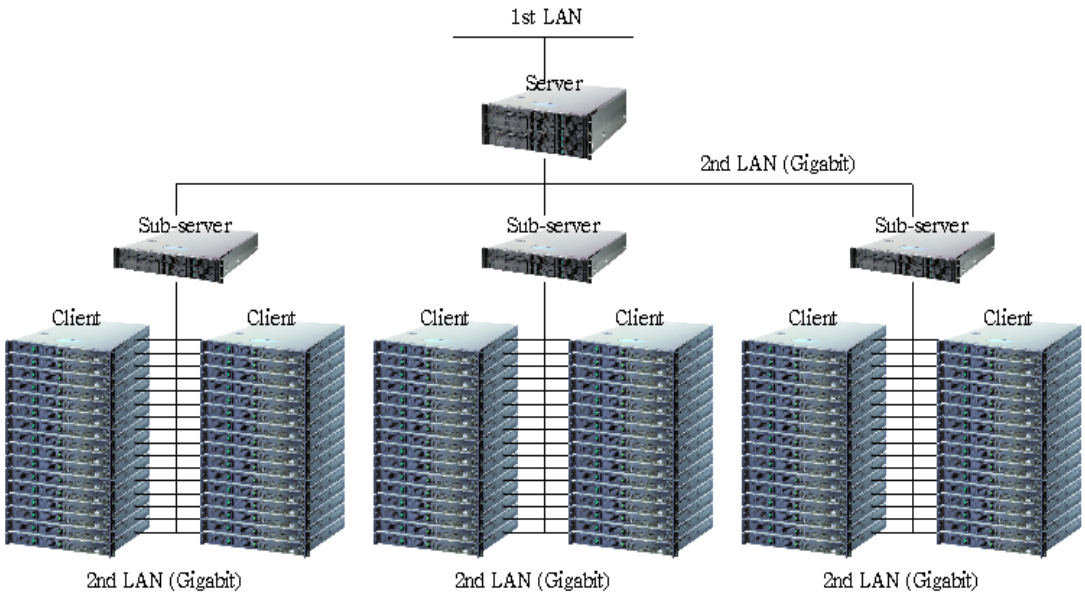
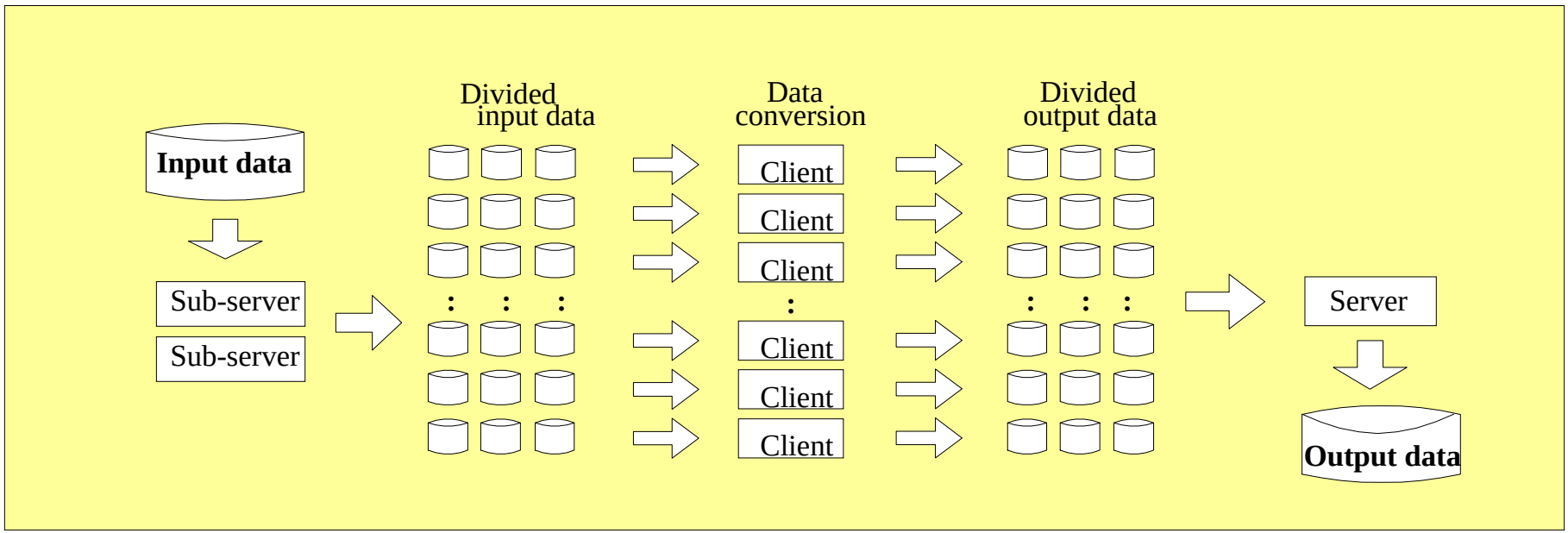


Server: Manages the whole system, prepares/distributes entry data, and coordinates output data
Sub-server: Distributes entry data
Client: Converts assigned data



3. EPL data conversion system

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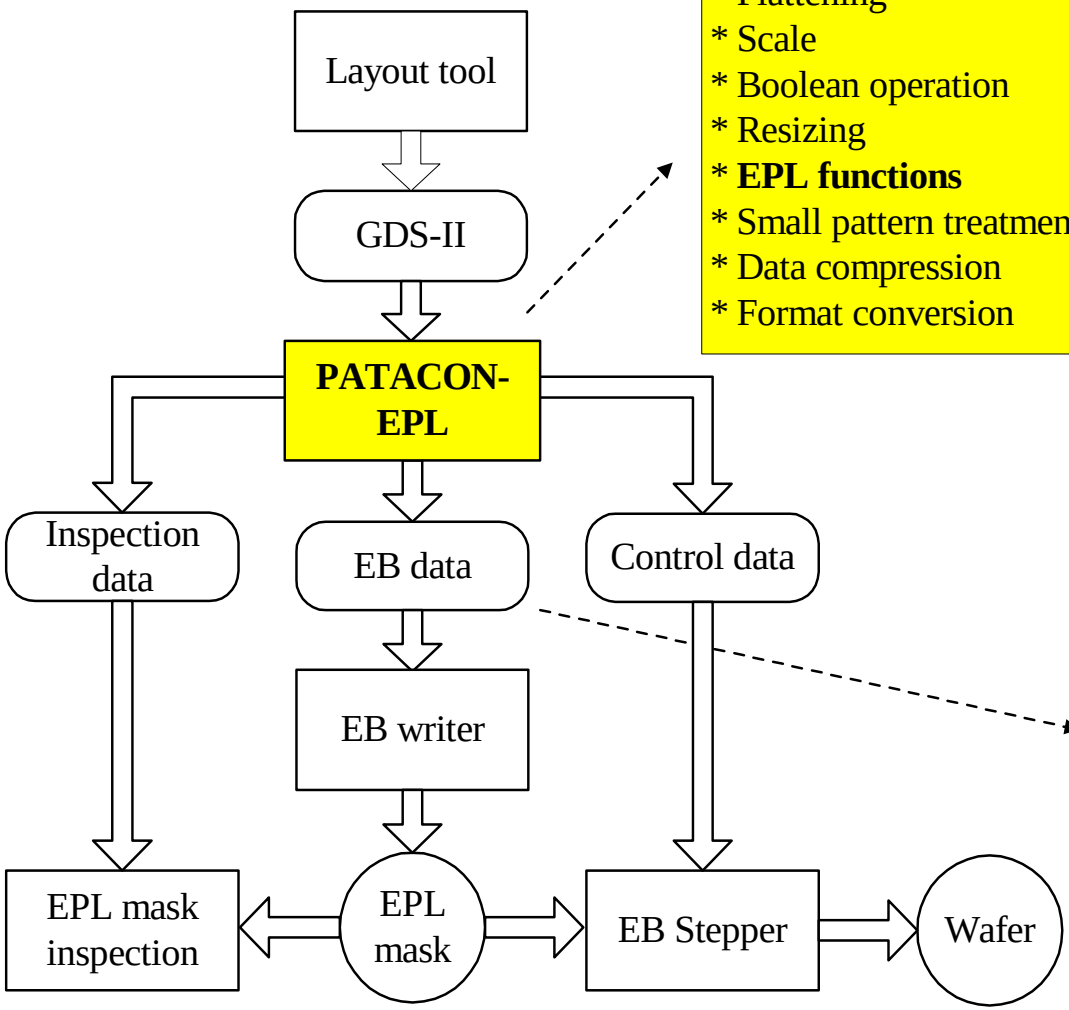

Data conversion functions

* Flattening
* Scale
* Boolean operation
* Resizing
* **EPL functions**
* Small pattern treatment
* Data compression
* Format conversion

EPL data conversion functions

* SF division
* Complementary division
* Stitching
* Proxymity effect correction
* NIKON plugin interface
* Alignment mark insertion
* EB stepper control data creation
* EPL mask inspection data creation
* Verification

EB data formats

* MEBES
* MEBES mode5
* JEOL52
* JEOL52V1.1
* JEOL52V2.1
* JEOL52V3.0
* JEOL52V3.1
* HL-700M/D
* HL-800M/D
* HL-900M/D
* HL-7000
* EBM (*1)
* BEF-2 (*1)

(*1) We have a plan to support this format

4. Conversion results

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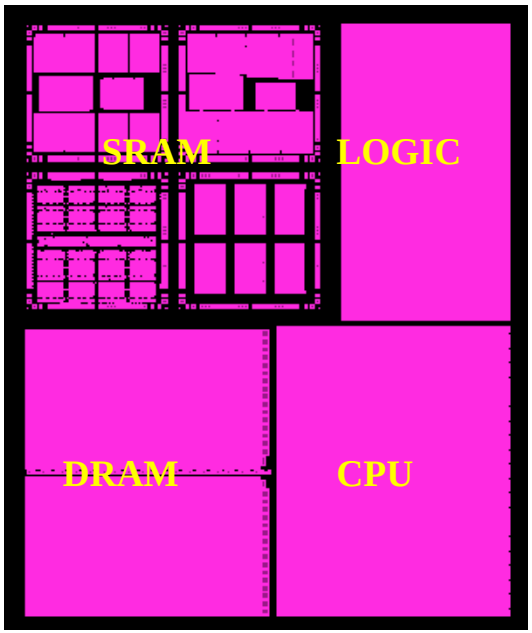
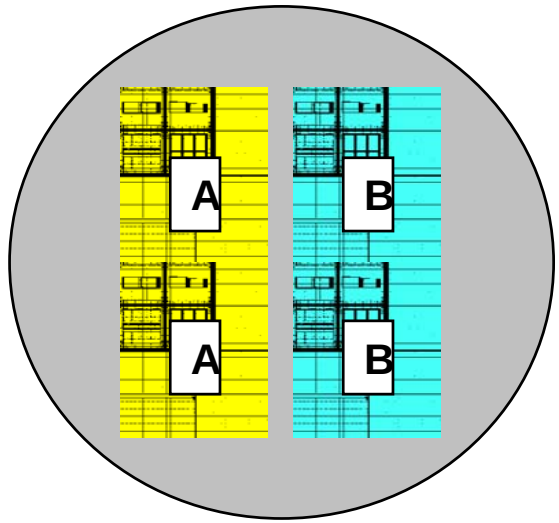
Evaluation data (Anaheim_Hi_Gate.str)

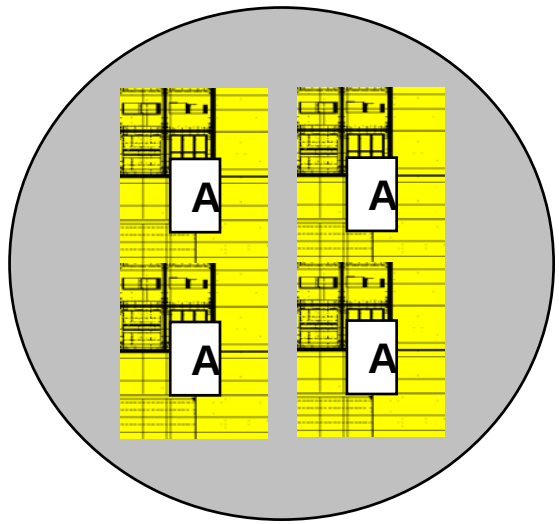


Mask size : 8 inches
Chip size : 10 x 25 mm (2 chips)
Split : Complementary division



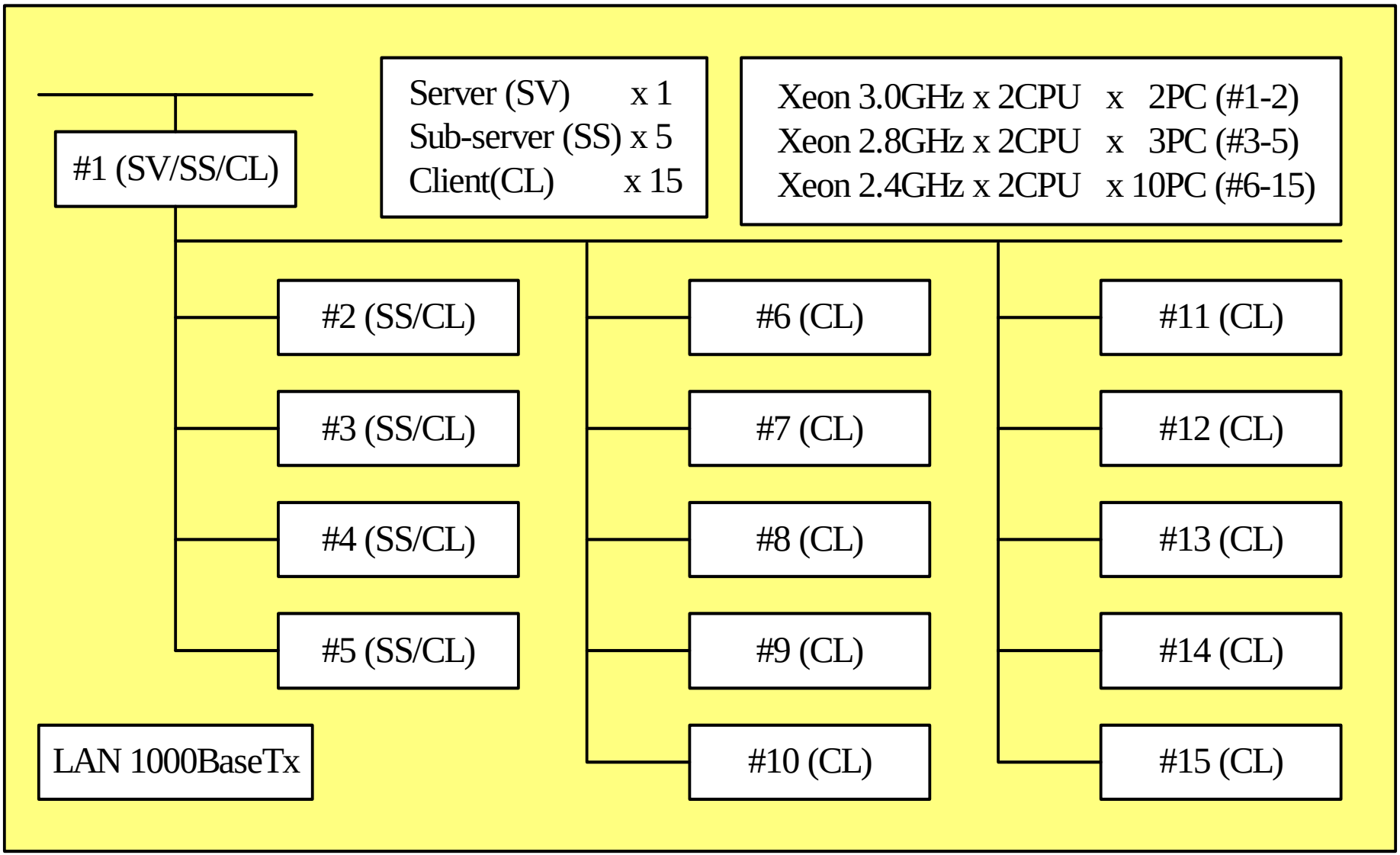
Chip size :	**10 x 12.5 mm on wafer**
Device :	**SoC gate layer**
Design rule:	**CPU 70 nm**
	LOGIC 70 nm
	SRAM 80 nm
	DRAM 100 nm

Mask size : 8 inches
Chip size : 20 x 25 mm (4 chips)
Split : No

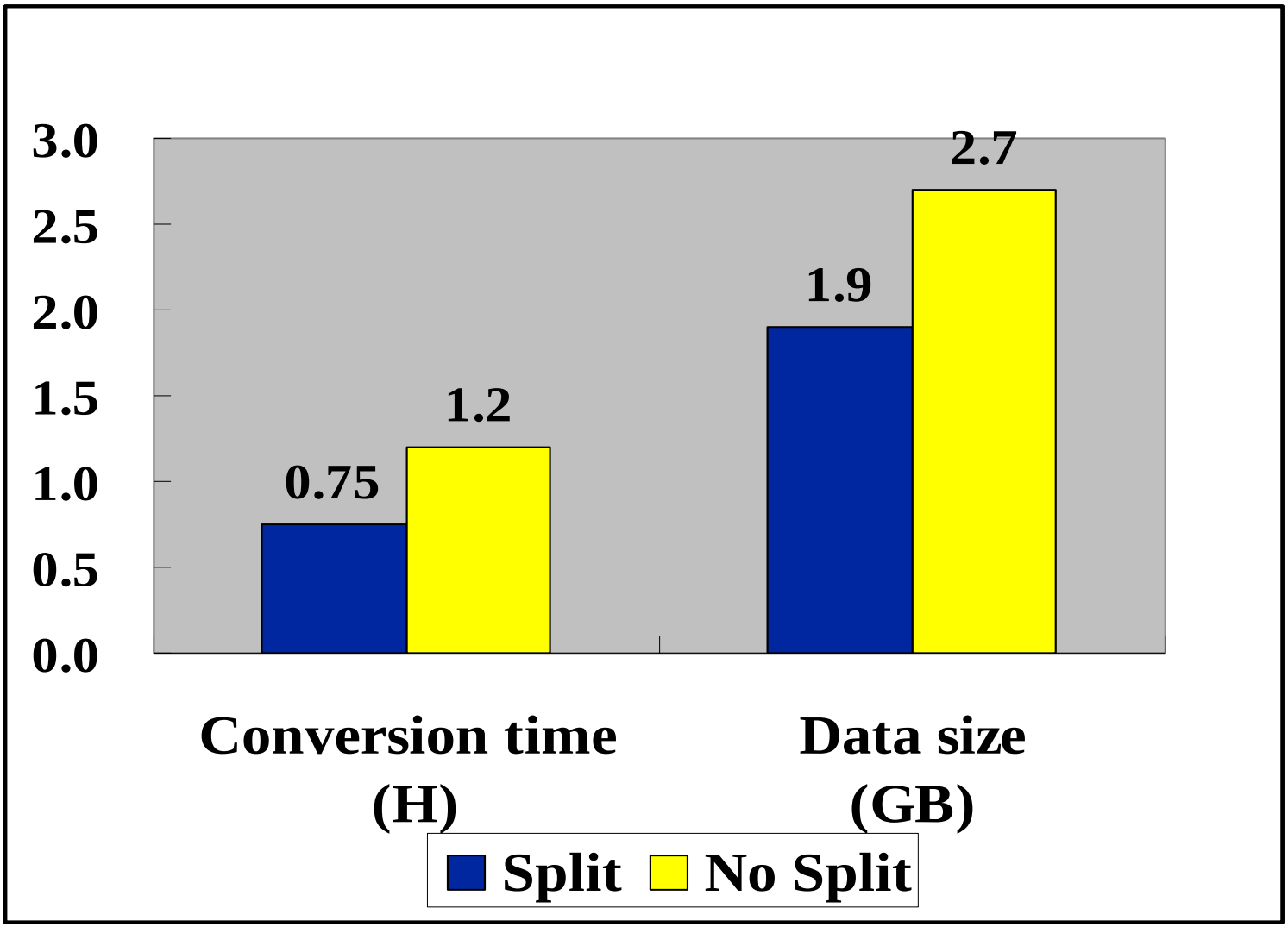


Borrowing data from Semiconductor Leading Edge Technorogies, Inc.

Configuration of PC-cluster



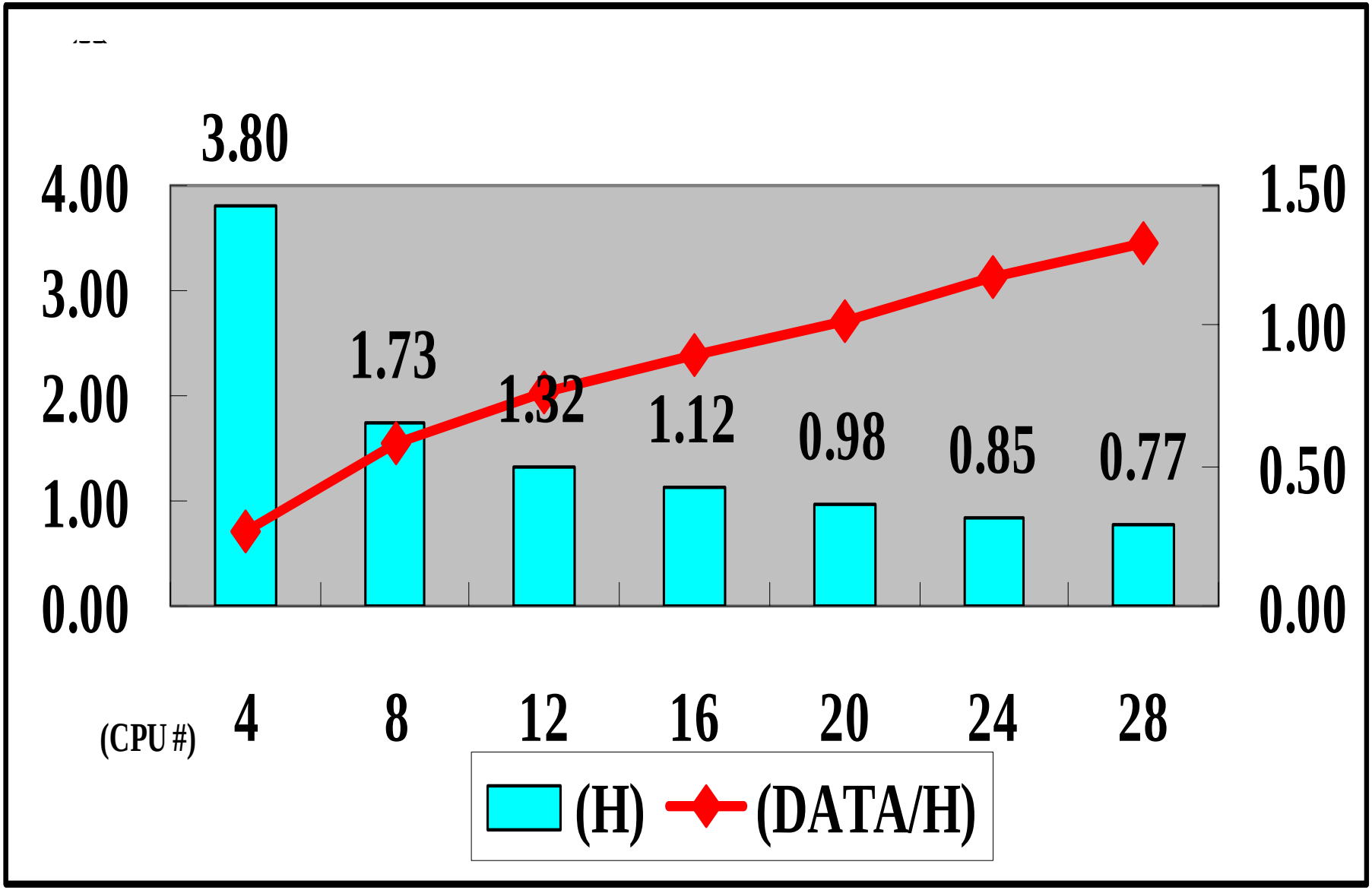
Conversion result (30 x CPU)



(*1) Output size is in case of converting to the JEOL52V3.0.

(*2) Conversion time is not including NIKON plugin-software processing time.

Performance of PC-cluster (Split data)



5. Summary

Nippon Control System

We are developing a EPL data conversion system runs on PC-cluster.

The beta version for making EPL masks is available now.

The features of PATACON PC-cluster for EPL are,

- Directly converting of CAD data to EB data
- Supporting of various EB format
- Making high quality mask writing data
- Rapid processing of large-scale data

We will continue development to provide higher quality mask data.