GRID Enabled Biochip Analysis

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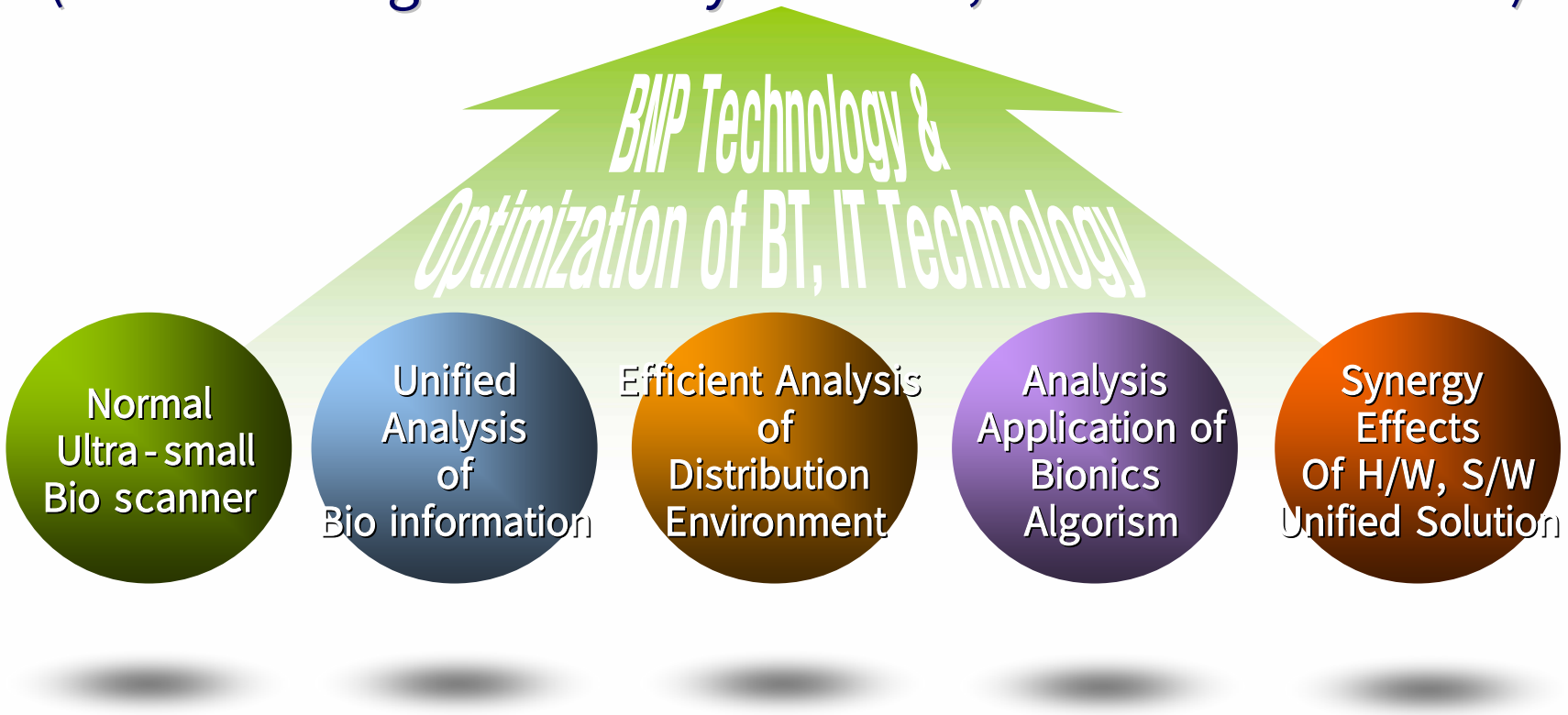
NationalGrid Tae Hoe Koo

Contents

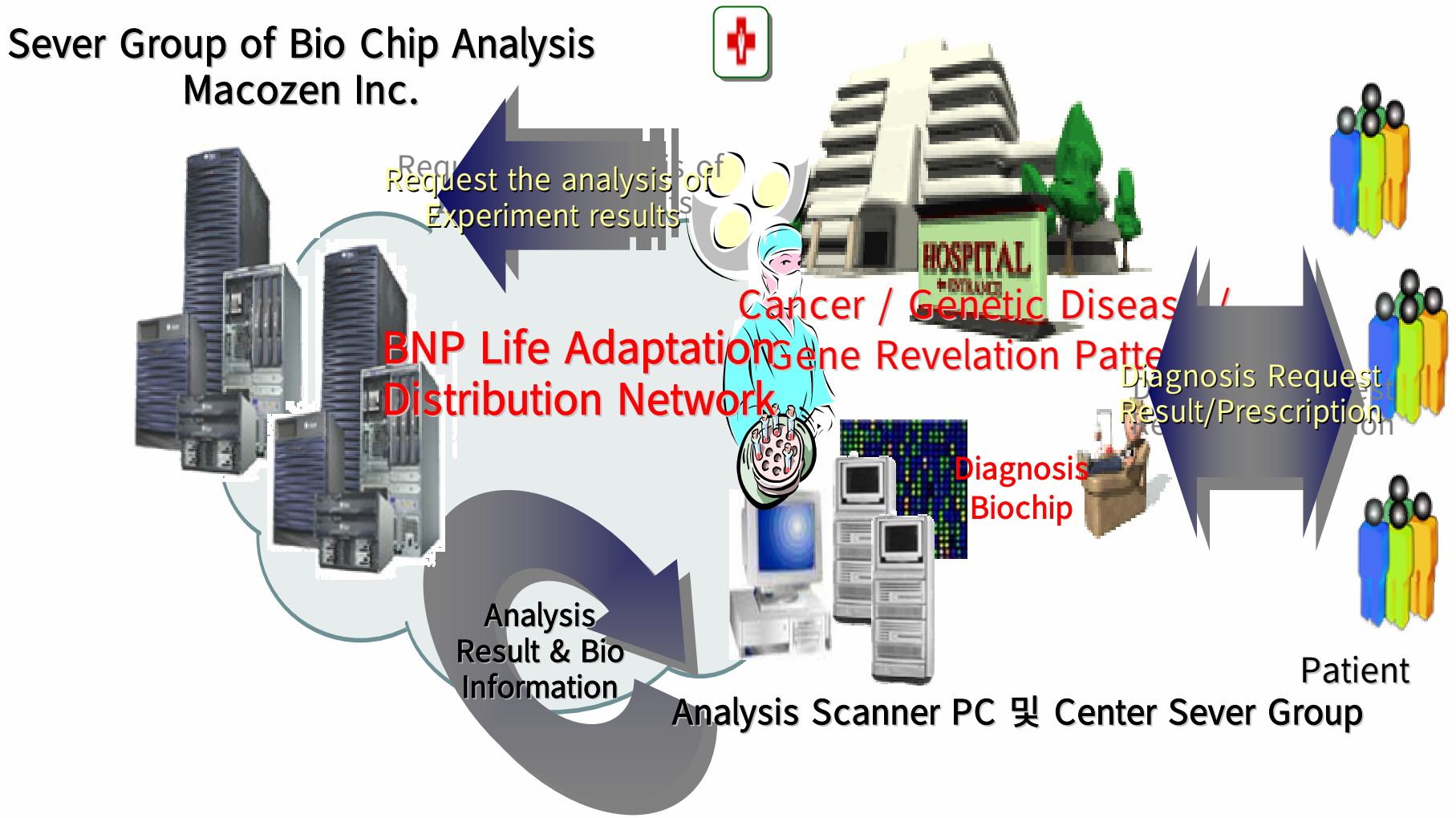
1-1. Final Target

Biochip Distribution Analysis System

(Medical Diagnosis Analysis Base, Commercialization)



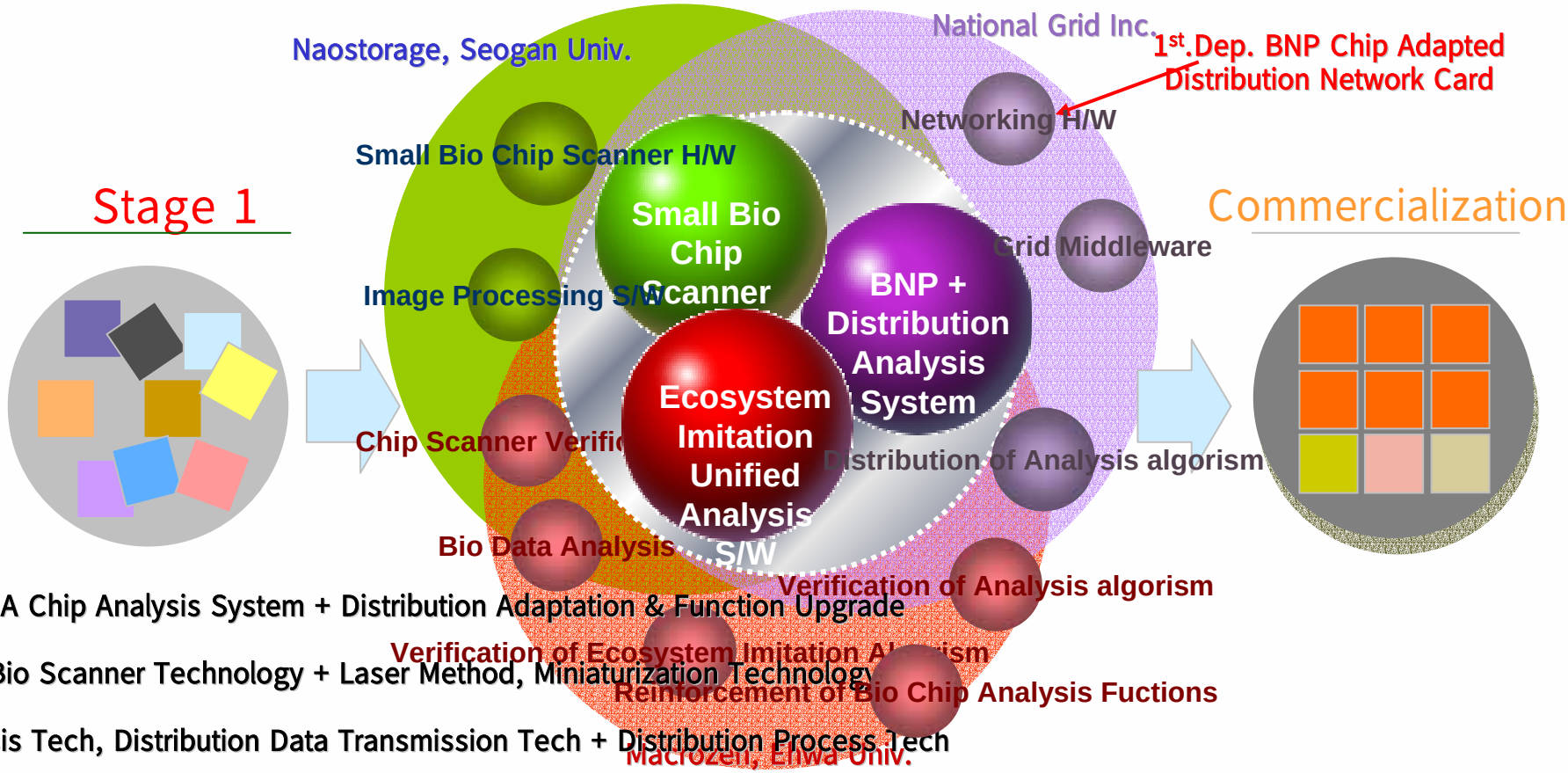
1-2. Concept Map of Development System



1-3. Stage & Related Institutions

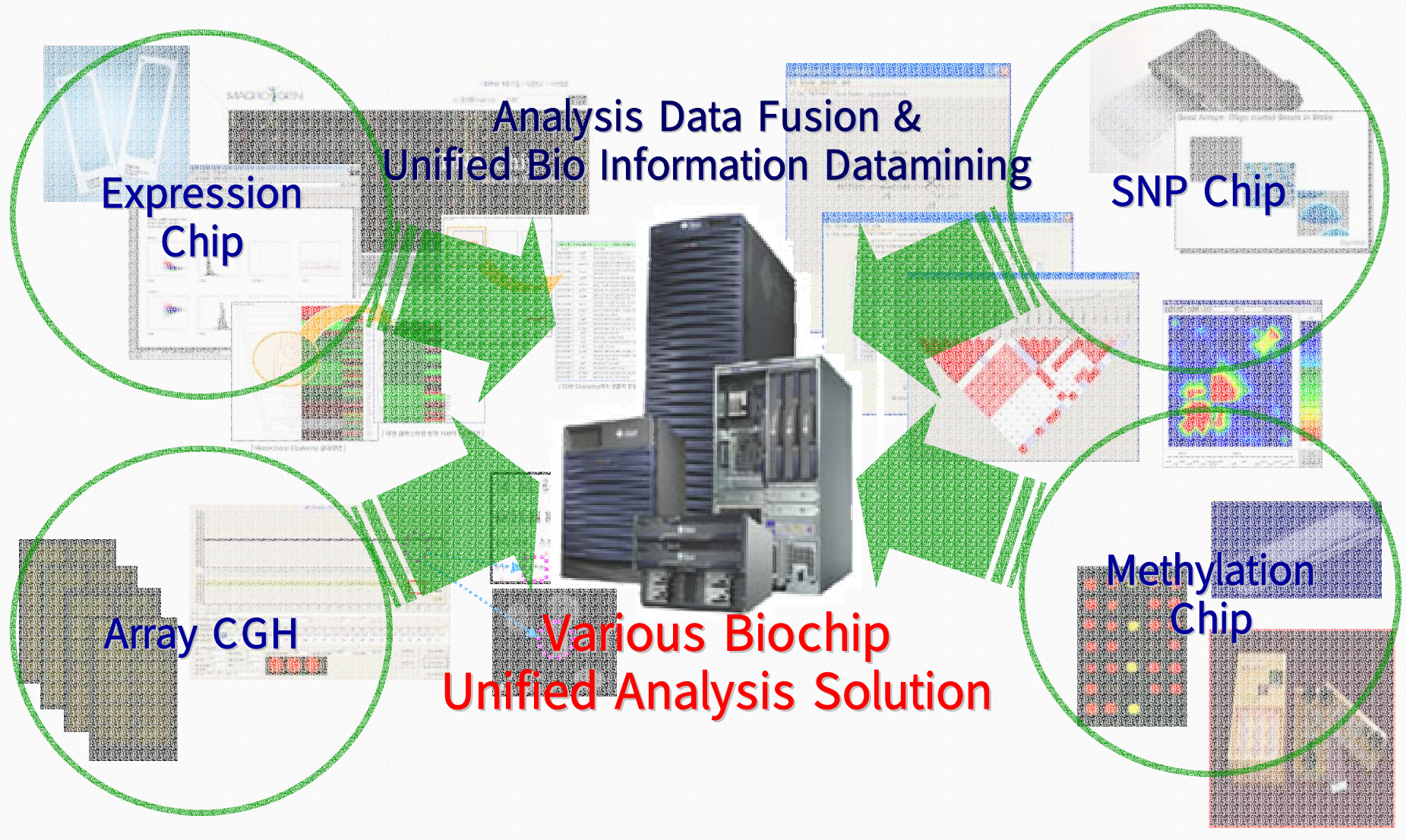
Stage 2

Life Network System of Bio Chip Unified Analysis



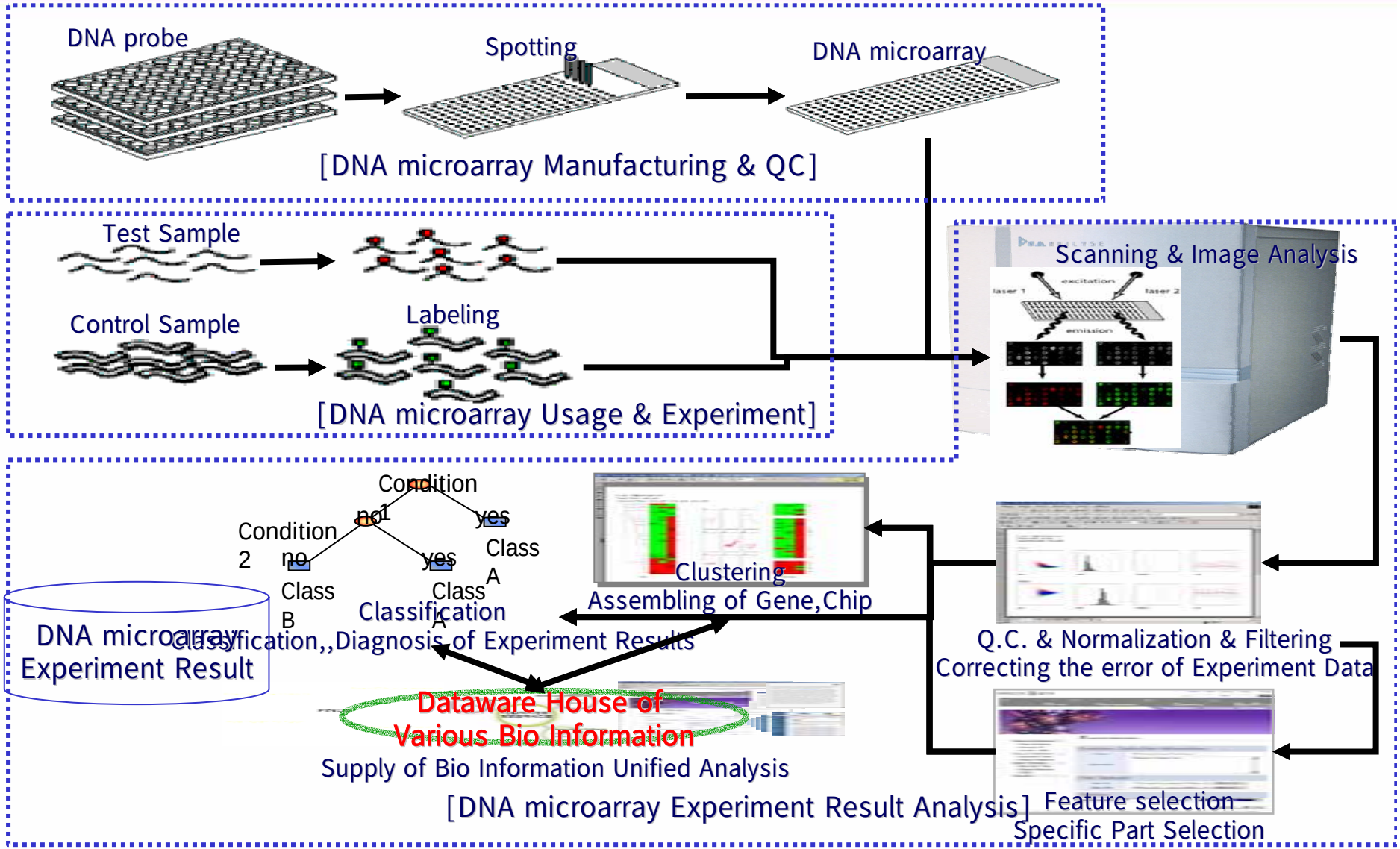
2-1. Biochip

Biochip Analysis Process



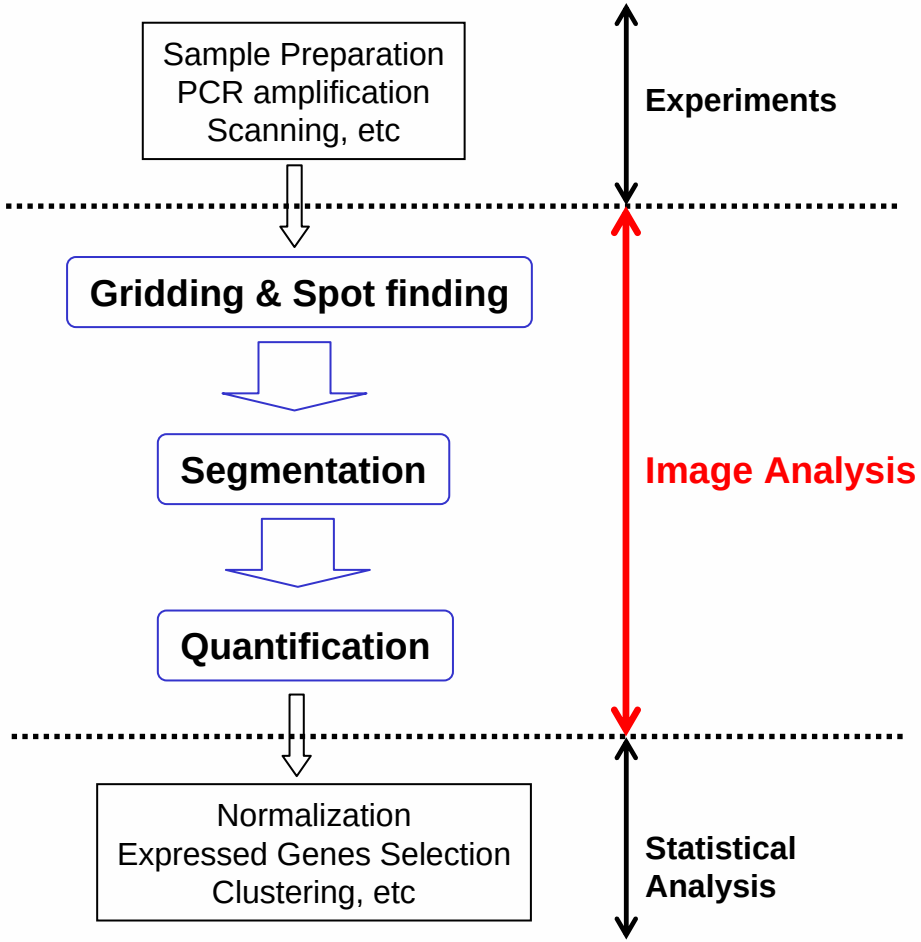
2-2. Total Process

Biochip Analysis Process



2-3. Image Processing

Biochip Analysis Process



Gridding & Spot finding

- Locate the signal spots in images
- Estimate the size of each spot
- Spots found

Segmentation

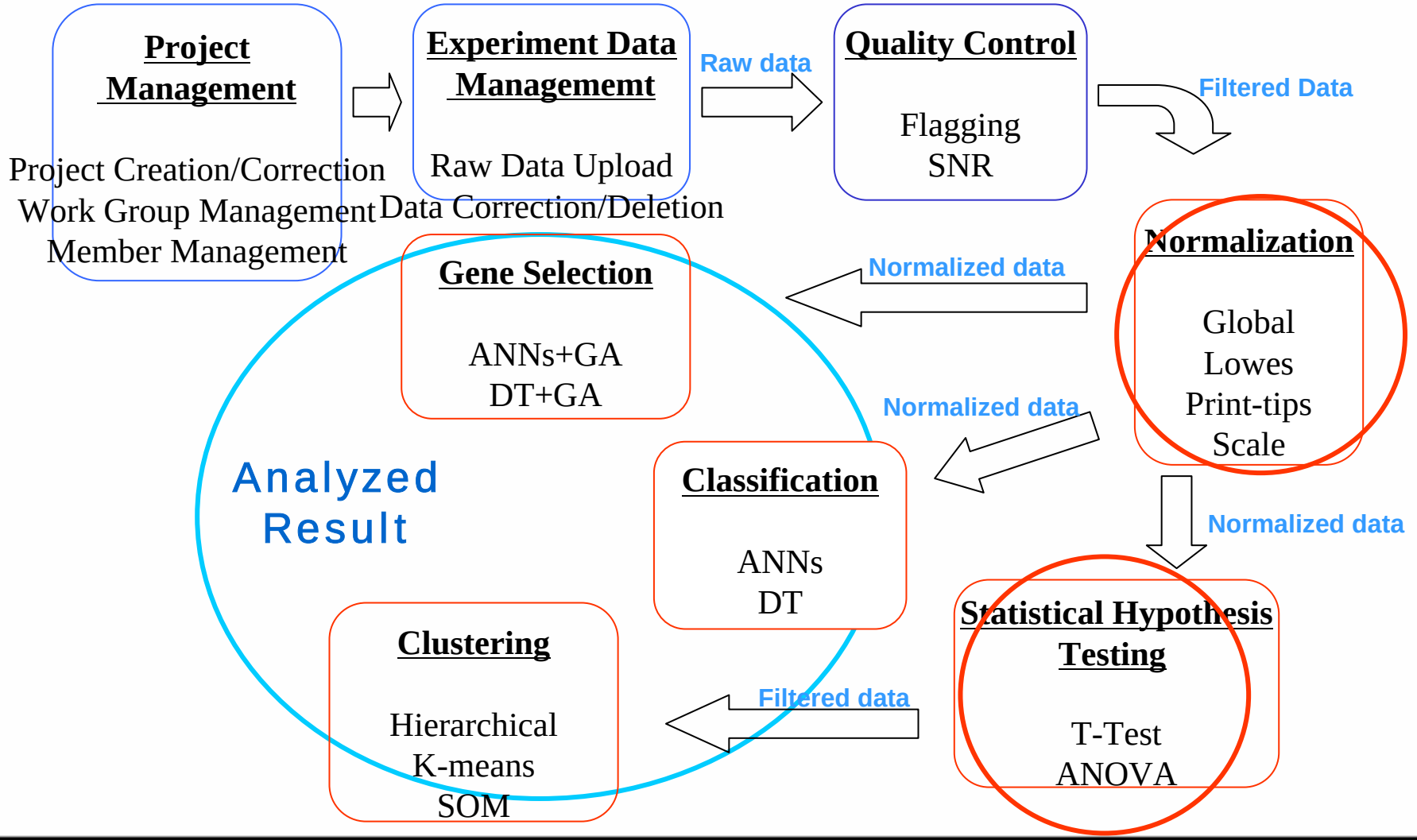
- Spots separated from background

Quantification

- To combine pixel intensity values
- into a unique quantitative measure

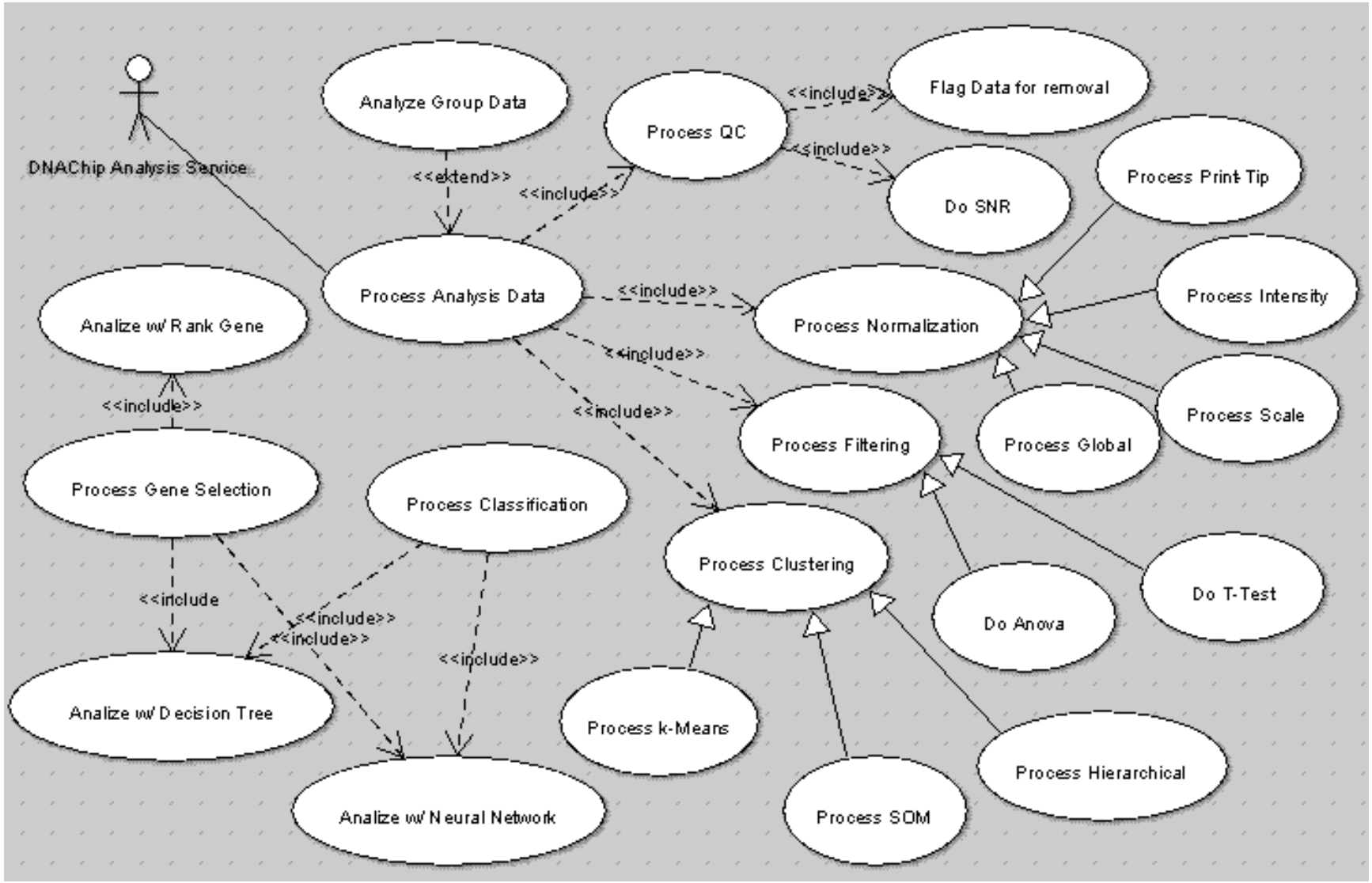
2-4. Statistical Analysis

Biochip Analysis Process



2-5. Use case diagram

Biochip Analysis Process



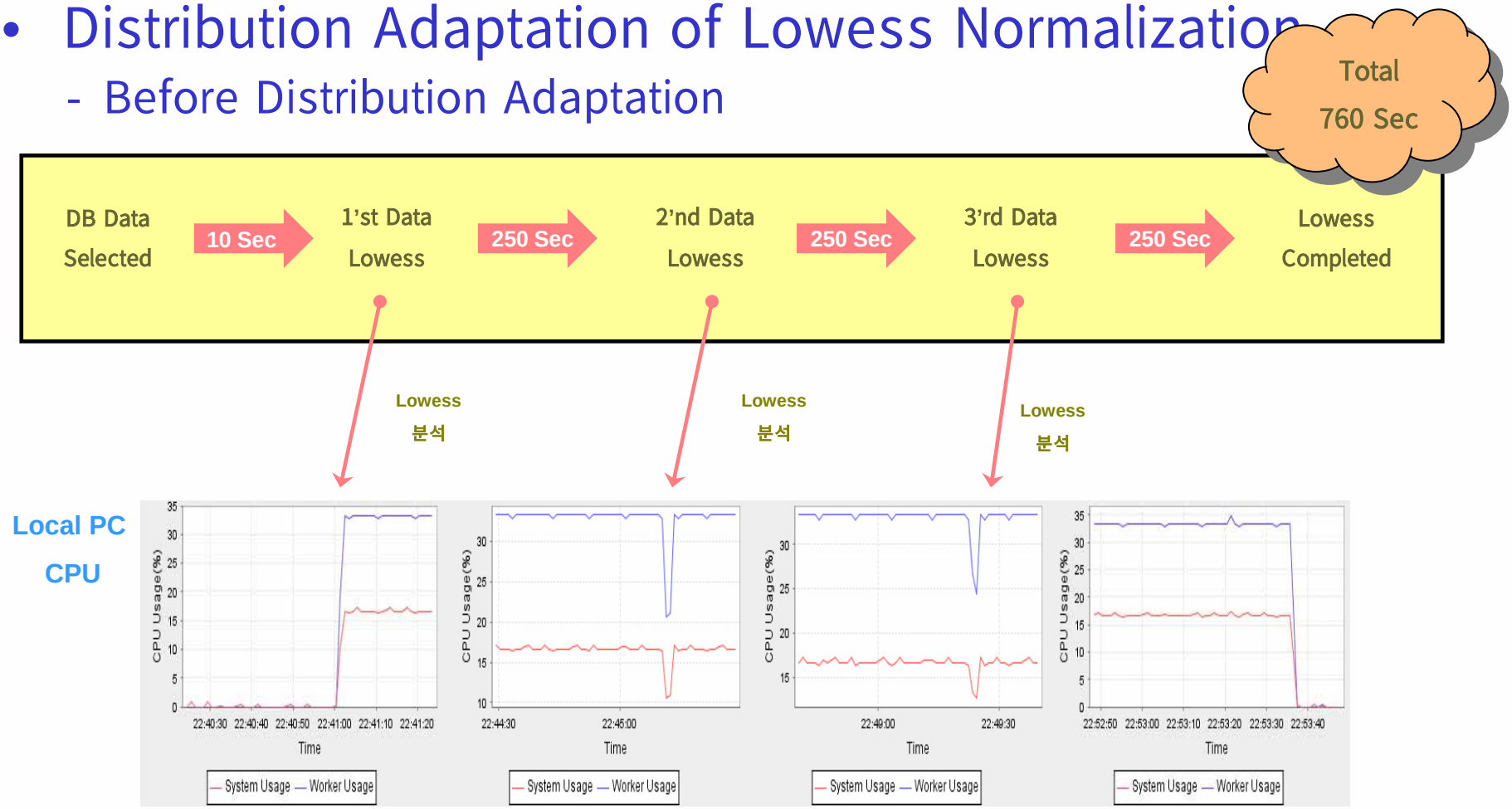
3-1. Summary

- Lowess Normalization & Distribution Adaptation of T-Test
- Distribution Borker Server, Distribution Labor PC Environment
  - 3.2GHz CPU, 2G Memory
  - Windows 2000 OS
  - Distribution Broker Server 1, Distribution Labor PC 3
- Lowess Algorithm
  - Sample Count : Reference 1, Test 3
  - Row Count : 15644
  - Option : Delta 0.0
    Smothing Parameter 0.66
    Iteration 10
- T-Test Algorithm
  - Number of Sample per Group: 3 (Total 6 samples)
  - Number of Sample per row : 33,012
  - The part of Distribution Adaptation: The most time-consuming Data Reading Part
- The effect of Distribution Analysis Adaptation
  - Long analysis time is required to perform the analysis of large volume Bio Data.
  - Able to reduce the analysis time by the ratio of the number of work node
  - More effective for repetition work
  - The knowledge of analysis process is required to adapt distribution Algorithm

3-2. Lowess Normalization

The Adaptation of Distribution Analysis

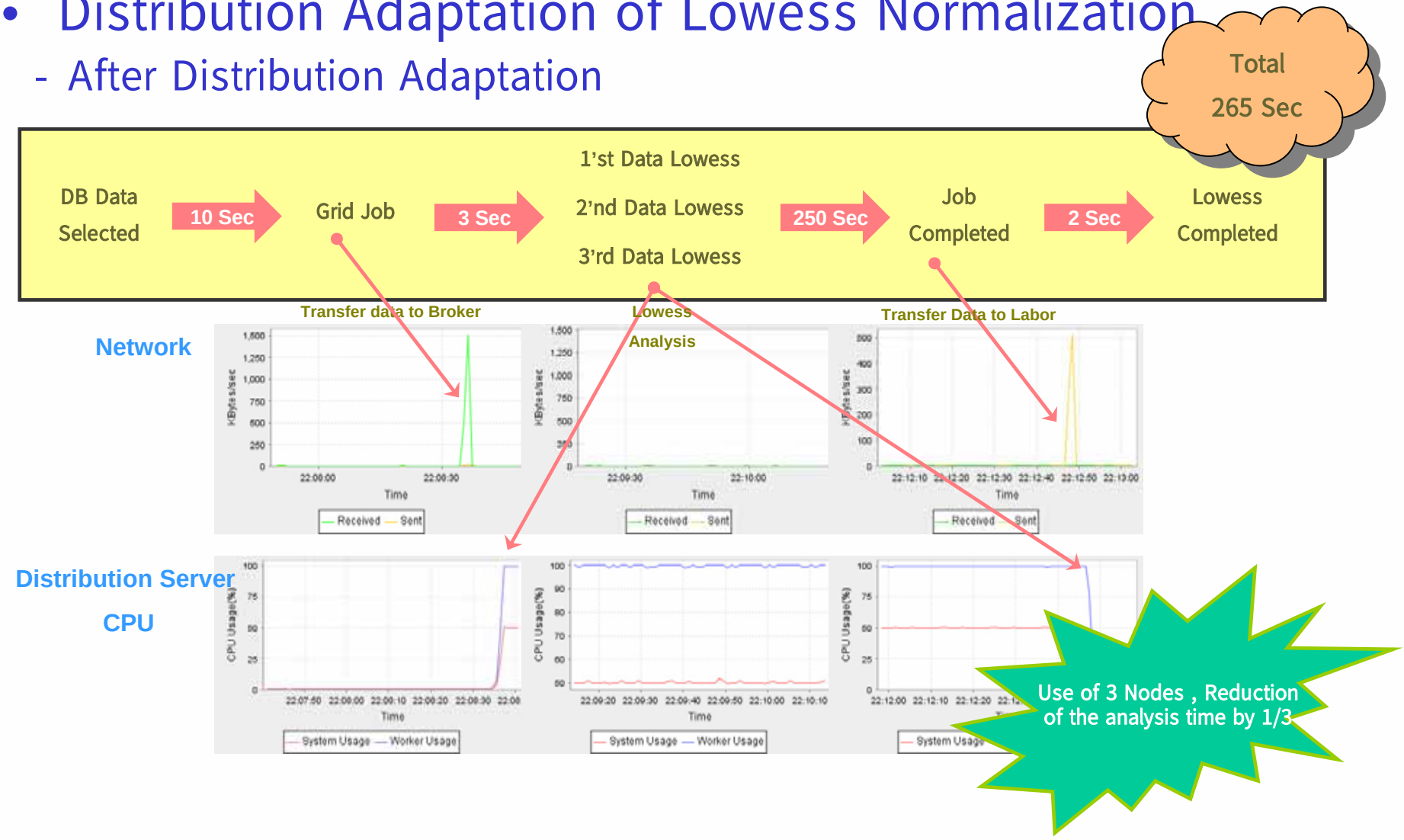
- Distribution Adaptation of Lowess Normalization
  - Before Distribution Adaptation



3-2. Lowess Normalization

The Adaptation of Distribution Analysis

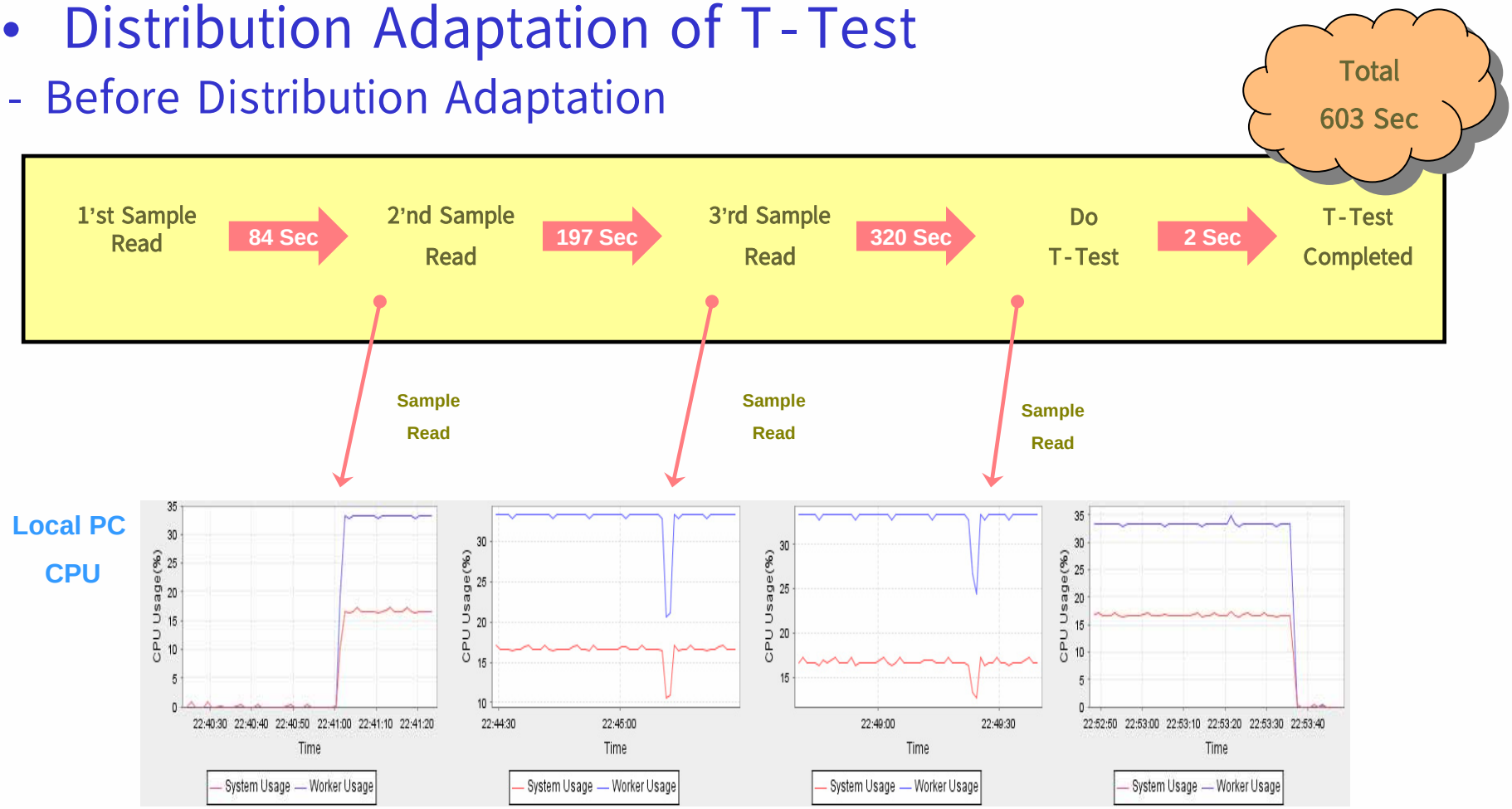
- Distribution Adaptation of Lowess Normalization
  - After Distribution Adaptation



3-3. T-Test

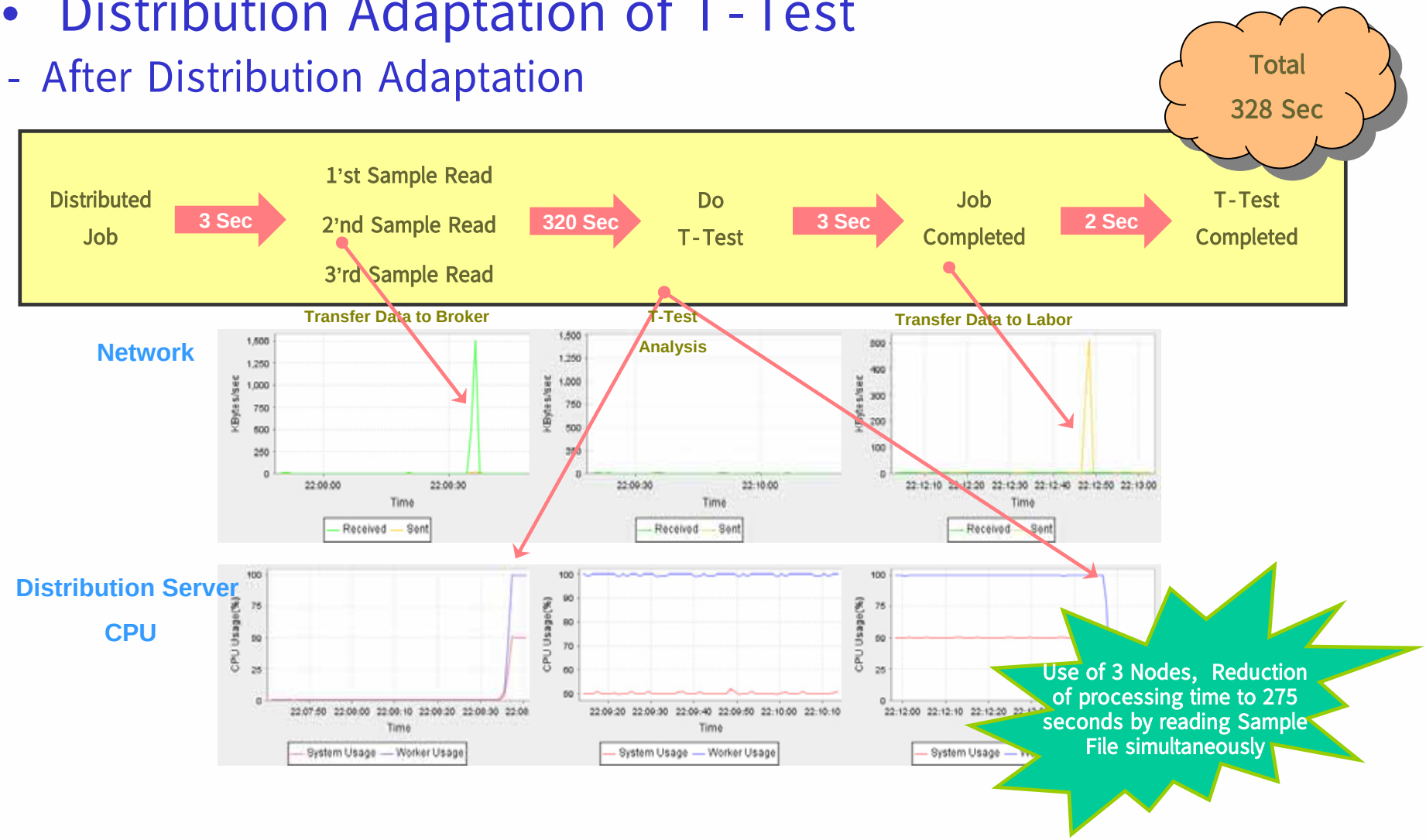
The Adaptation of Distribution Analysis

- Distribution Adaptation of T-Test
  - Before Distribution Adaptation



3-3. T-Test

- Distribution Adaptation of T-Test
  - After Distribution Adaptation



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