



## Future Cyber Infrastructure Architecture Based on Optical Total Disaggregation

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### Grand Challenge and Goal:

The goal is to achieve “Optical Total Disaggregation,” which will completely disaggregate all computing and network resources, and directly and freely connect computing resources via optical paths, enabling 10 times more efficient data processing

### Summary:

- To realize optical total disaggregation (Fig. 1), we will research (1) “all-scale optical data flow technology” and (2) “resource management technology for optical total disaggregation”
  - (1) Develop a protocol enabling high-efficiency multiple data flows (Fig. 2) through direct optical connections between arbitrary function blocks
  - (2) Developing a model to achieve diverse resource management through the integration of communication and computation, and developing optimal resource allocation algorithms (Fig. 3)
- This proposal represents a new challenge: integrating fully disaggregated computing and communication resources and optimizing the entire system on a unified platform

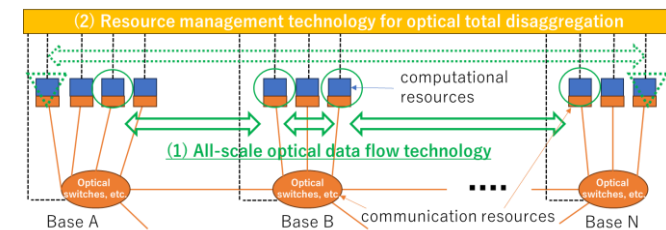


Fig. 1 : Optical total disaggregation image

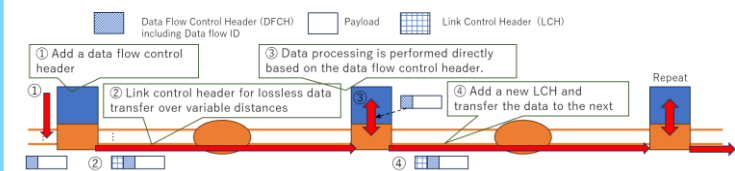


Fig. 2 : multiple data flows

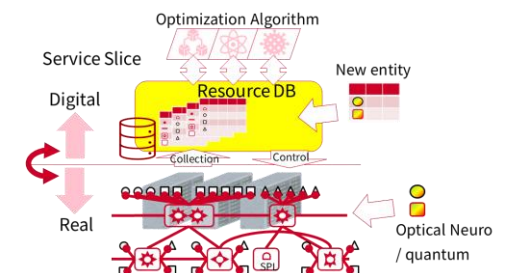


Fig. 3 : Optical total disaggregation image

### Social Impact:

Create a new technological paradigm where increased performance does not lead to increased power consumption, and realize new sustainable infrastructure