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Oki, Network Solutions for a Global Society

All-optical network of next generation

Calient DiamondWave® PXC

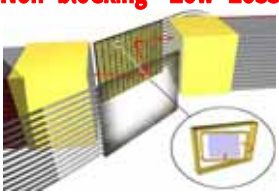
— Network construction of flexible, high reliability is realized by PXC —

By a GMPLS interconnect with an other layer device, it realizes dynamic switching in a network physically. As a result, setting of the most suitable pass of End-to-End is enabled easily and it takes a detour course at the time of obstacle outbreak automatically.

APPLICATIONS

- NGN (Next generation networks) by telecom career
- Service of low cost / flexibility / high reliability
- An office with much connection changes of optical fiber

Maximum Switch Size 256 x 256
Non-blocking ・Low-Loss



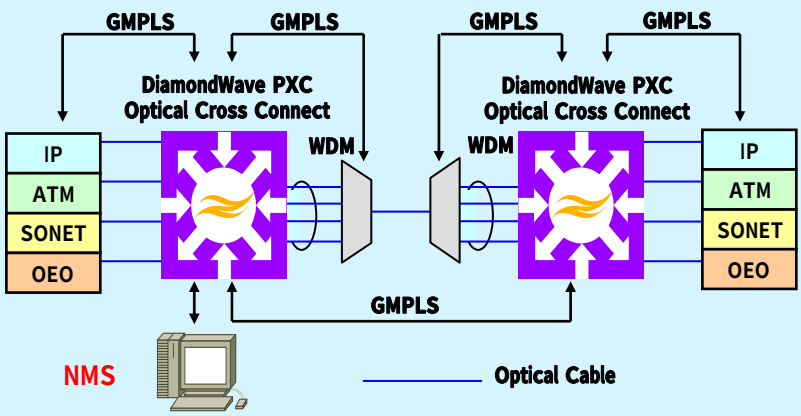
MEMS
(Micro Electro-Mechanical Systems)

FEATURES

- **All optical cross-connect system by 3D MEMS Optical Switch**
- **GMPLS (Generalized Multi-Protocol Label Switching) network intelligence**

DiamondWave® PXC
2134 mm (H)×864 mm (W) ×693 mm (D)

GMPLS with PXC
(PXC：All optical cross-connect system)
DiamondWave®



BENEFITS

- **Reduce opex and capex**
  - ⇒ Highest capacity in most compact footprint, low power consumption
  - ⇒ Extension easiness by interface free and bit-rate free
  - ⇒ Efficiency improvement of NW Provisioning by GMPLS
- **Network construction with high reliability**
  - ⇒ End-to-end & automated network provisioning by GMPLS
  - ⇒ Route change by automatic operation at failure by GMPLS

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Research & Development information

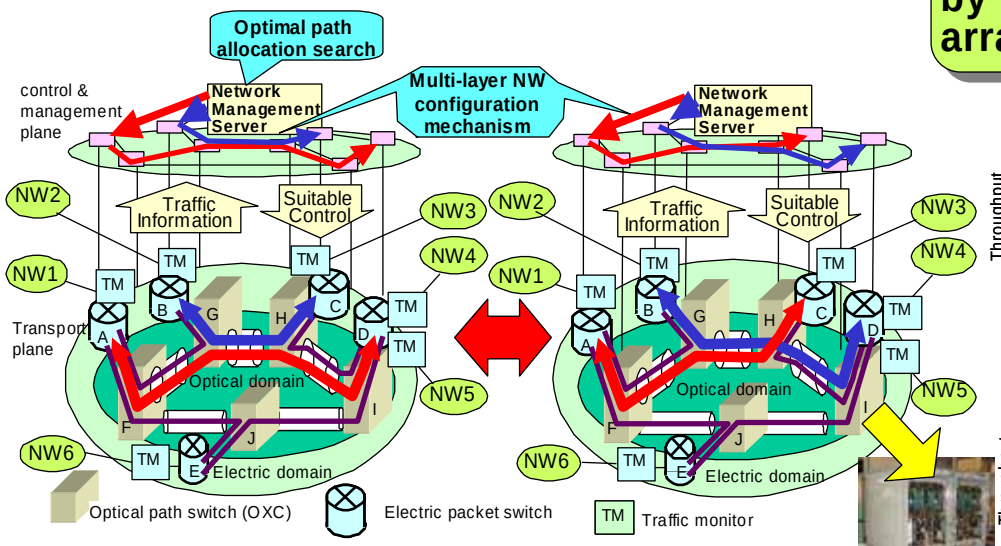
IP-Photonic traffic engineering network - Dynamic path allocation system -

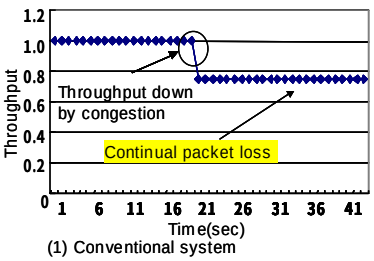
When the traffic between NW1&NW4, NW2&NW3 are heavy

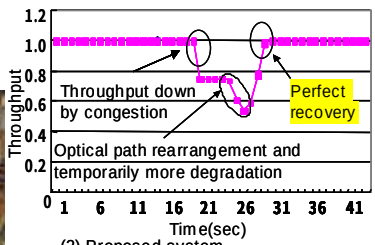
When the traffic between NW1&NW3, NW2&NW4 are heavy

Objectives

- Maximization of network throughput by dynamic path re-arrangement







Experimental results

Acknowledgement A part of this work is supported by National Institute of Information and Communication Technology in Japan(NICT).

Target System

Objectives of operation

- Maximization of throughput

How to?

- Dynamic rearrangement of optical path and packet forwarding route

Target

- Tbit/s node using optical layer cut-through

Expectation

- Improvement of efficiency of resource utilization in IP optical multi-layer network
- Multi-service network, SLA, provisioning, etc....

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Demonstration of key technology 1

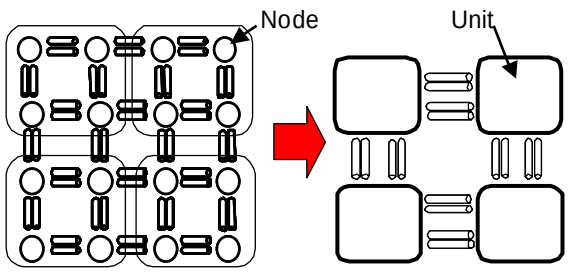
High-speed optimal Optical-path and Packet-forwarding-route search Engine

Method1

Heuristic algorithm in which paths are allocated between 2 nodes in order of traffic volume, then search better answer

Method2

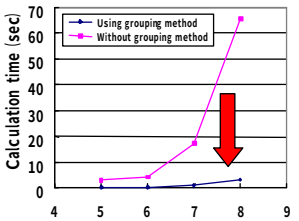
Reduction of calculation time based on grouping method

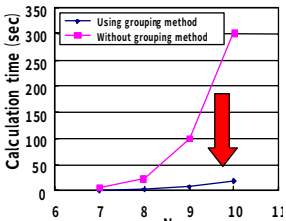


4x4=16 nodes mesh network

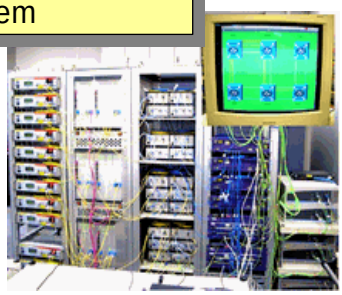
2x2=4 units mesh network

Examples of performance





Experiment using 6 nodes test-bed system

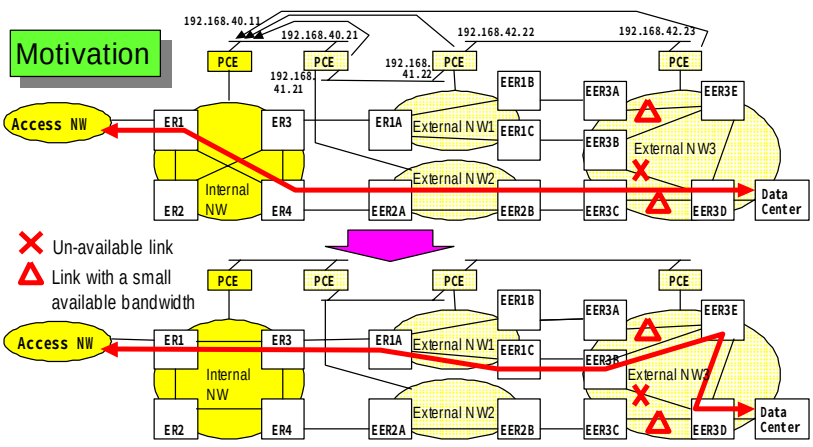


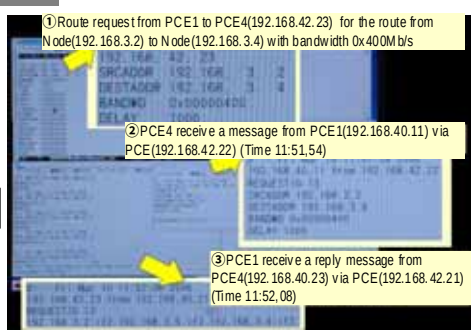
Demonstration of key technology 2

Path route calculation in corporation with external network using PCEP

Now Demonstrated in ShowCase Area

Motivation





PCEP=Path Computation Element Communication Protocol (Will be RFC in IETF)

- **Applications**
  Traffic engineering, Multi-layer/multi-domain network, Partial visibility, etc・・・

Oki's implementation

- Basic functions
  route request / reply, session open, error notification etc・・・
- Auto discovery and information flooding

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