AFCS Application

Transoceanic Cable Landing Site Monitoring

Jim Diestel

408 232-6413

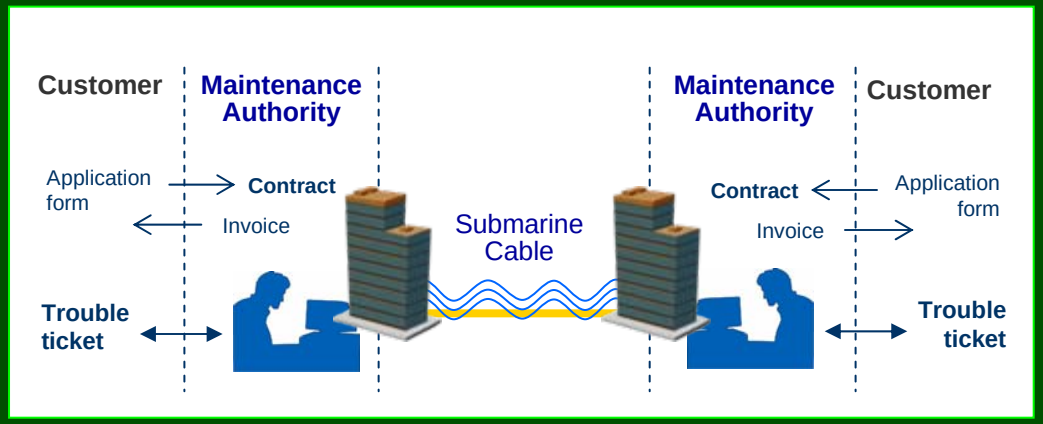
jdiestel@calient.net

January 2009

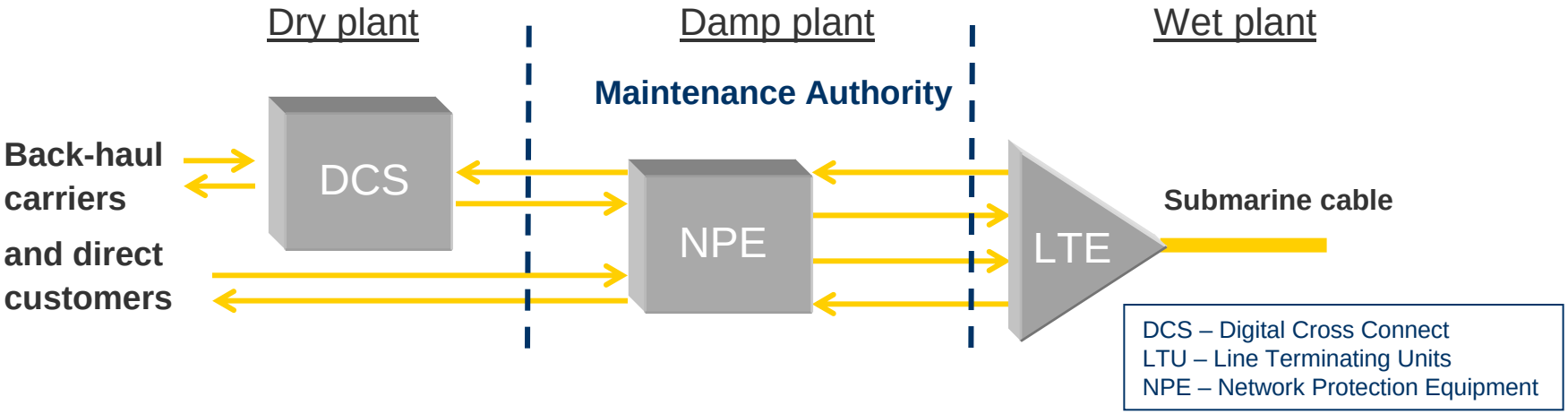
AFCS FORUM
Advanced Fiber Connectivity and Switching Forum

Submarine Cable Market in Transition

- Strong post-bubble readjustment
- Global services market growth with increasing competition
- Submarine cables are strategic to delivery of added-value services globally
- Increasing productivity pressure
- Unique environment with high environmental and quality constraints



Submarine Landing Station Today



- Clear demarcation at submarine landing points between the Maintenance Authority and the back-haul carriers and large customers
- Service availability critical with contractual SLA penalties: the need for local staff drives high cost of operation
- Lack of insight on sub-lambda traffic: submarine cable is often not the cause of the problem, leading to unnecessary interventions
- The convergence to IP will require more monitoring capability

How to maintain service quality and reduce cost of operation?

Submarine Cable Landing Challenges

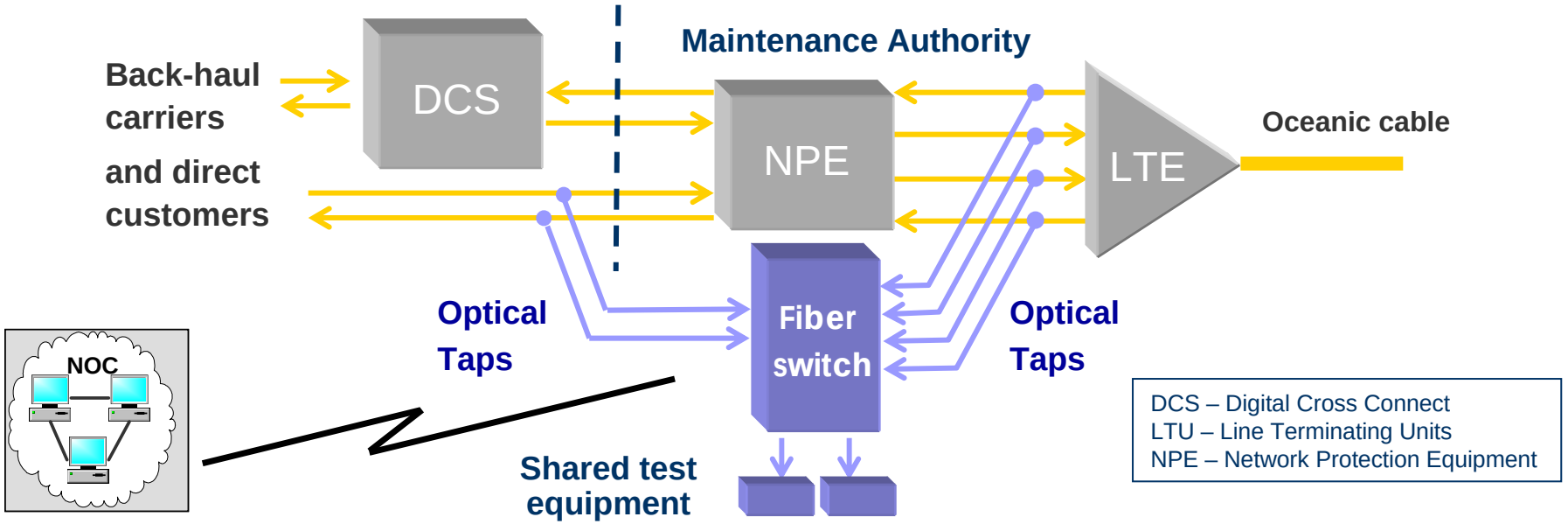
- Service continuity is critical, maintenance windows few and scheduled
- Severe pressure on costs due to protracted price erosion and overbuild
- Multiple masters; cable consortium and terrestrial customers, including upper management of the Maintenance Authority
- New IP based traffic requirements, IP services cannot be monitored by legacy tools
- Increasing contractual commitments on service quality
- Trend to integrate submarine systems with terrestrial networks
- Dramatically increasing bandwidth on submarine cables

Submarine Cable Landing Site - Future

- How Can AFCS Help?
  - Lower operational cost with remote monitoring and trouble-shooting capability
  - More efficient use of skilled personnel for value-added activities – dispatch after fault isolation only as needed
  - Capital savings resulting from sharing test & monitoring equipment
  - Service level improvement resulting from quick trouble-ticket resolution and preventive maintenance - continuous polling for fault prevention
  - Increased customer satisfaction
  - IP level monitoring of service
  - Historical database on every fiber

Remote Test Access & Monitoring w/ Optical Switch

- Insertion of optical taps provide access points without affecting traffic
- Central fiber switch enables:
  - Monitoring and trouble-shooting any fiber path in the landing station
  - Share the cost of test equipment (SDH testers, etc)
  - Provide remote access and control from NOC



Submarine Cable Landing Site - Benefits

- Technical Benefits
  - Ability to remotely monitor and test fibers, off-line relative to traffic path for non-intrusive testing
  - Any fiber to any test port
  - Fiber test equipment permanently connected and available at any time
  - Continuous polling for fault prevention, settable threshold levels for diagnostic intervention
  - Historical performance database on every fiber, performance records for service quality audit
  - Propagates network element alarms and initiates automatic testing
  - Single command interface, common look across network
  - High CapEx and OpEx Return On Investment

Submarine Cable Landing Site

- Quantitative Financial Benefit Calculation
  - Remote operation provides real OpEx savings
    - Network Operations Center monitoring and fault isolation dramatically reduces need for 7x24 technician presence and reduces unnecessary dispatch
    - Actual savings achieved between $100-250k yearly savings per site
  - Other economic factors
    - Ability to share test equipment across multiple fiber connections
    - Avoid SLA penalties: continuous remote monitoring allows preventive maintenance (one carrier attributed $200,000 savings avoiding one event)
    - Increased utilization of expensive test equipment increasing CapEx ROI
    - Other cost reductions: night shift differentials, vacation/absence coverage costs, training cost

Submarine Cable Landing Site

- Who Can Benefit from the Application
  - Submarine Maintenance Authorities
  - Transoceanic Carrier Consortiums
  - Carriers with Daisy-chained Oceanic Long Haul Fiber