Removing the Architected Single Point of Failure in AdvancedTCA®

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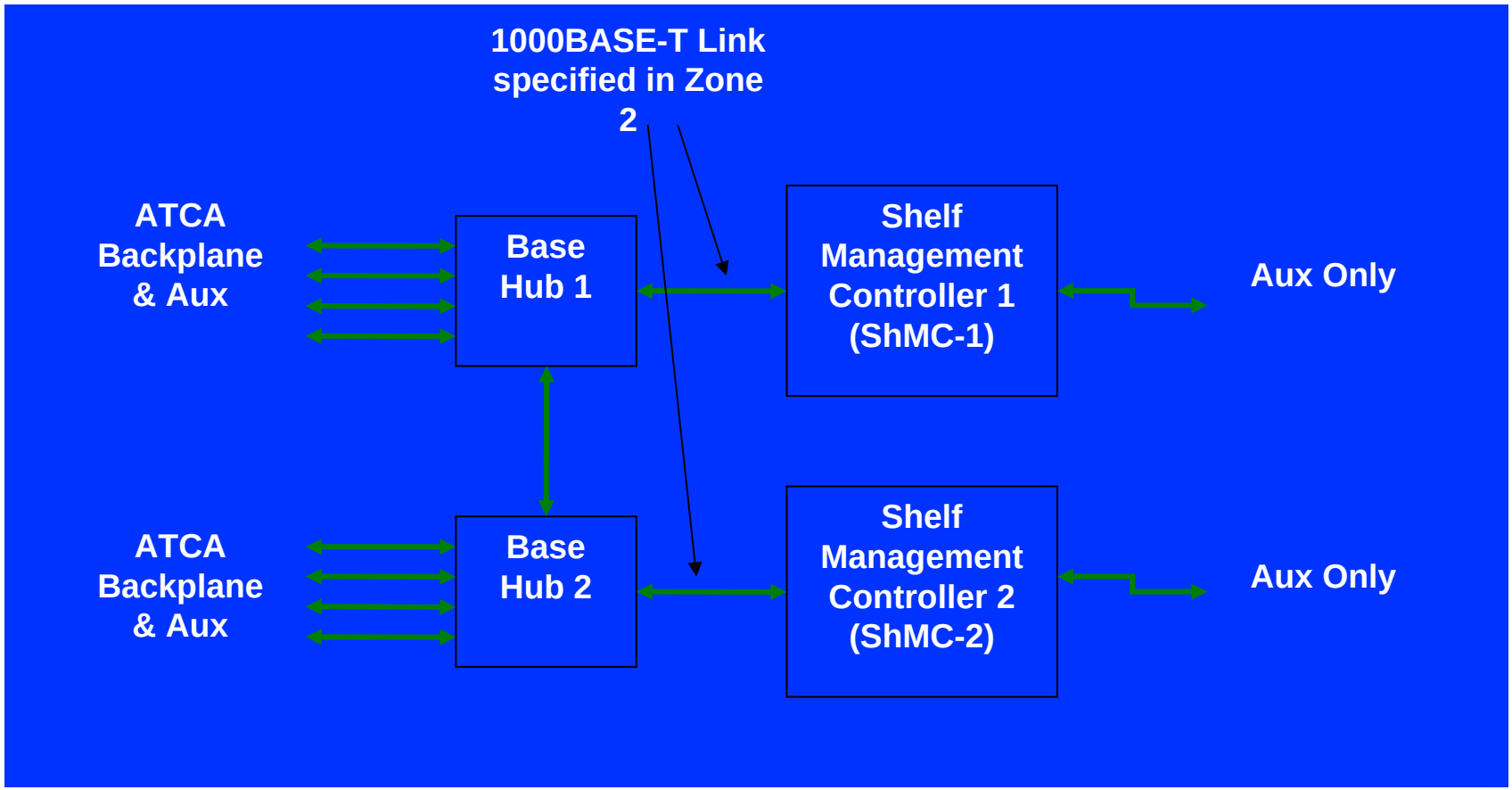
Overview

- Problem and its availability impacts
- Overall solution and specific aspects of the resulting PICMG Engineering Change Notice (ECN)
- Implementation sketch for backward compatible hubs
- Conclusion

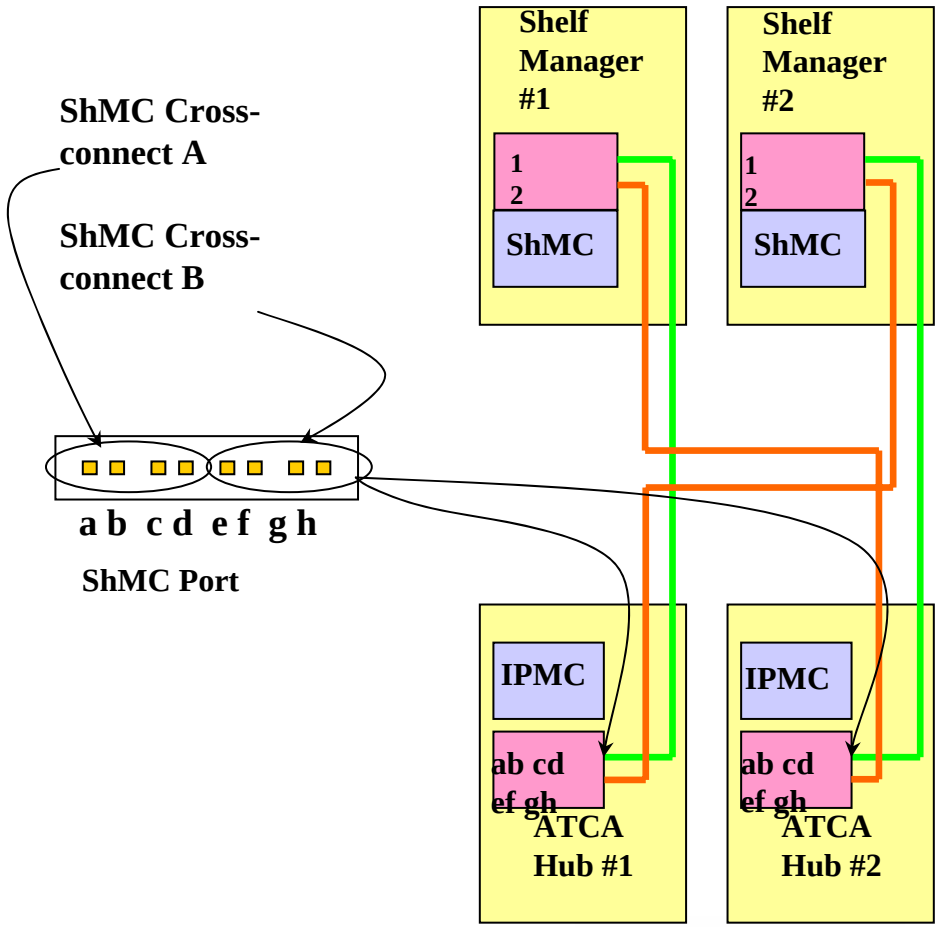
Problem: Original ATCA Provides One 10/100/1000 ShMC Port per Hub



Result: Availability Limitations Due to Switchover Constraints

- Failure in an ShMC requires hubs to switch if inter-hub links are not used
- Failure in a hub requires ShMCs to switch
- Such coordinated switchovers of two distinct types of FRUs are difficult to do well
  - Until failed FRU is replaced, neither hub nor ShMC is redundant
- Overall, original architecture reduces the effectiveness of dual redundancy in ShMCs and hubs, due to above coupling effects

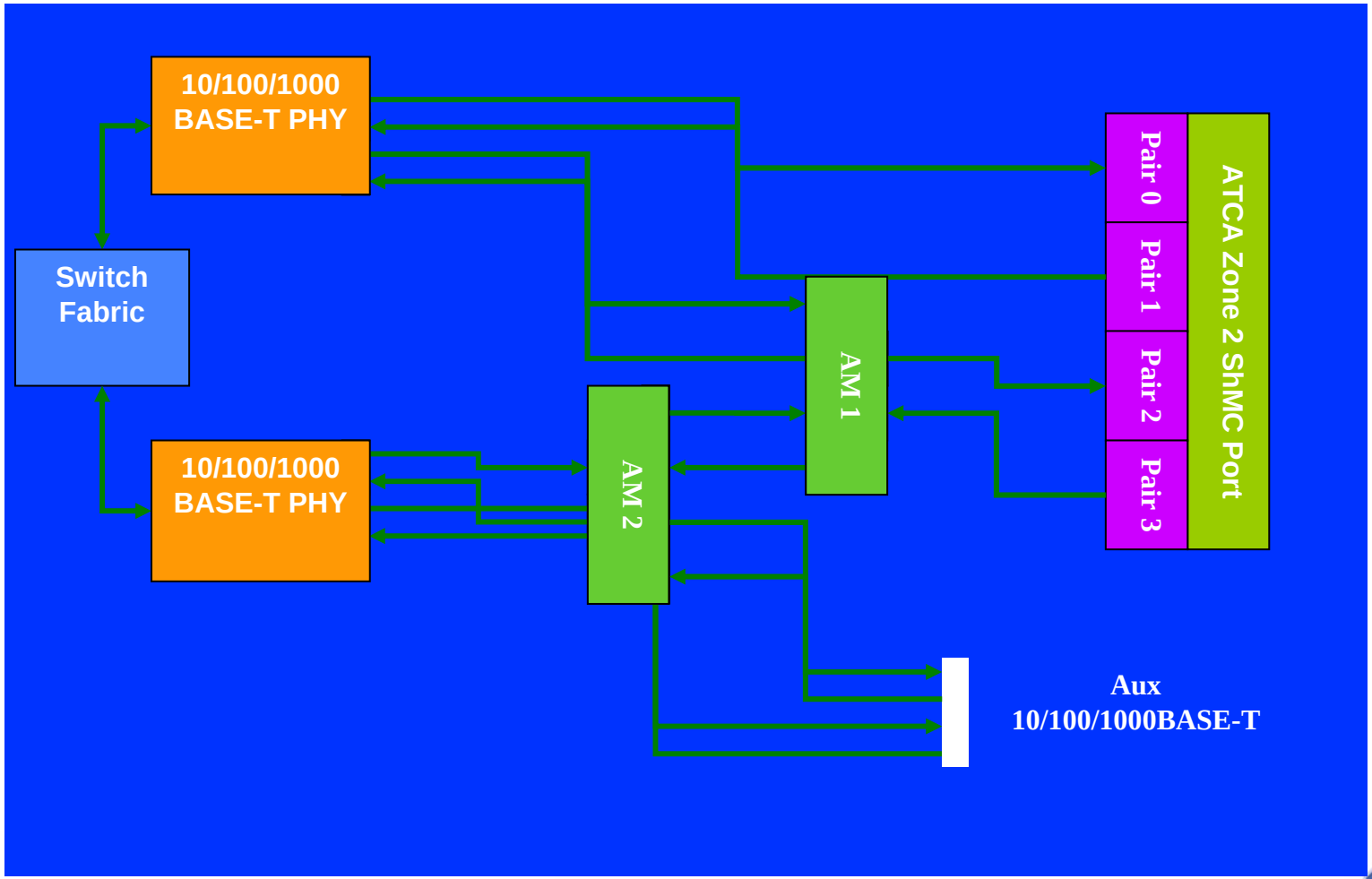
Solution: Split Hub's 4-Pair ShMC Port Into Two 2-Pair 10/100 Links: One per ShMC



Correction Mechanism: Engineering Change Notice (ECN) to PICMG 3.0 R2.0

- PICMG subcommittee focused specifically on this topic
- Concept first proposed in June, 2004; formal PICMG adoption in June, 2005
- Though overall idea is simple, details required considerable work and ~25 pages of spec content
- Primary overall challenge: confirming/enabling backward compatibility with pre-ECN components
  - E-Keying extensions allow hubs to support either one 10/100/1000 link to ShMC Port, or two 10/100 links
    - Dynamic adjustment based on installed configuration
    - Similar compatibility can be implemented on shelf managers
  - Investigation of available PHY products/specs regarding operation of auto-negotiation between a 4-pair PHY and two 2-pair PHYs

Implementation Sketch for Backward Compatible Hub



ShMC Cross-connects Extension to AdvancedTCA

- Addresses an important weakness of the original ATCA architecture, with real system availability benefits
- Moved quickly from concept through adopted specification and support in production products
- Provided a welcome opportunity for PPS to work closely and quickly with our customers and PICMG on an important problem

- Make sure your AdvancedTCA shelf and hub board vendors support this vital feature!

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AdvancedTCA™

PCI INDUSTRIAL PICMG COMPUTERS

Speaker Background

Mark Overgaard founded Pigeon Point Systems (PPS) in 1997 to focus on products and services supporting the adoption of open modular platforms to replace proprietary architectures, with an initial focus on the telecommunications market and CompactPCI. He is a leader in the technical subcommittees of PICMG (including the management aspects of AdvancedTCA and AdvancedMC). The current PPS product focus is the IPM Sentry line of platform management components: the first "off-the-shelf" AdvancedTCA shelf and board level management components, now supporting AdvancedMC carriers and modules, as well. Previously Mark was VP, Engineering at Lynx Real-Time Systems (a Unix-compatible RTOS supplier) and TeleSoft (a major supplier of embedded development solutions for Ada).

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