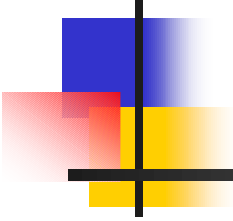




# On SRLG for Diversity and Risk Assessment (ANSI T1X1.5/2001-098)



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## Outline

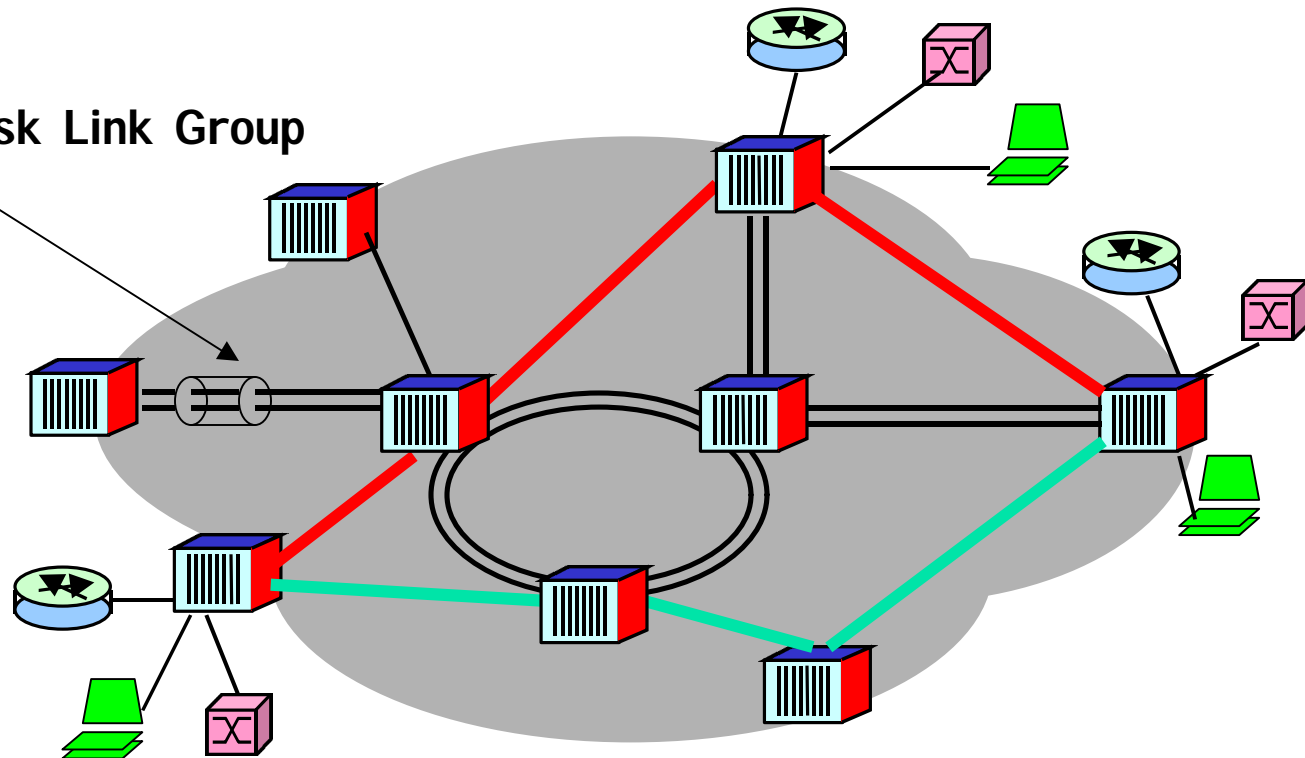
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- Shared Risk Link Group (SRLG)
- Path Diversity
- Goals
- Risk assessment
- Risk Assessment Steps
- Steps in Achieving Diversity
- Requirements
- Extensions
- Conclusions

## Shared Risk Link Group (SRLG)

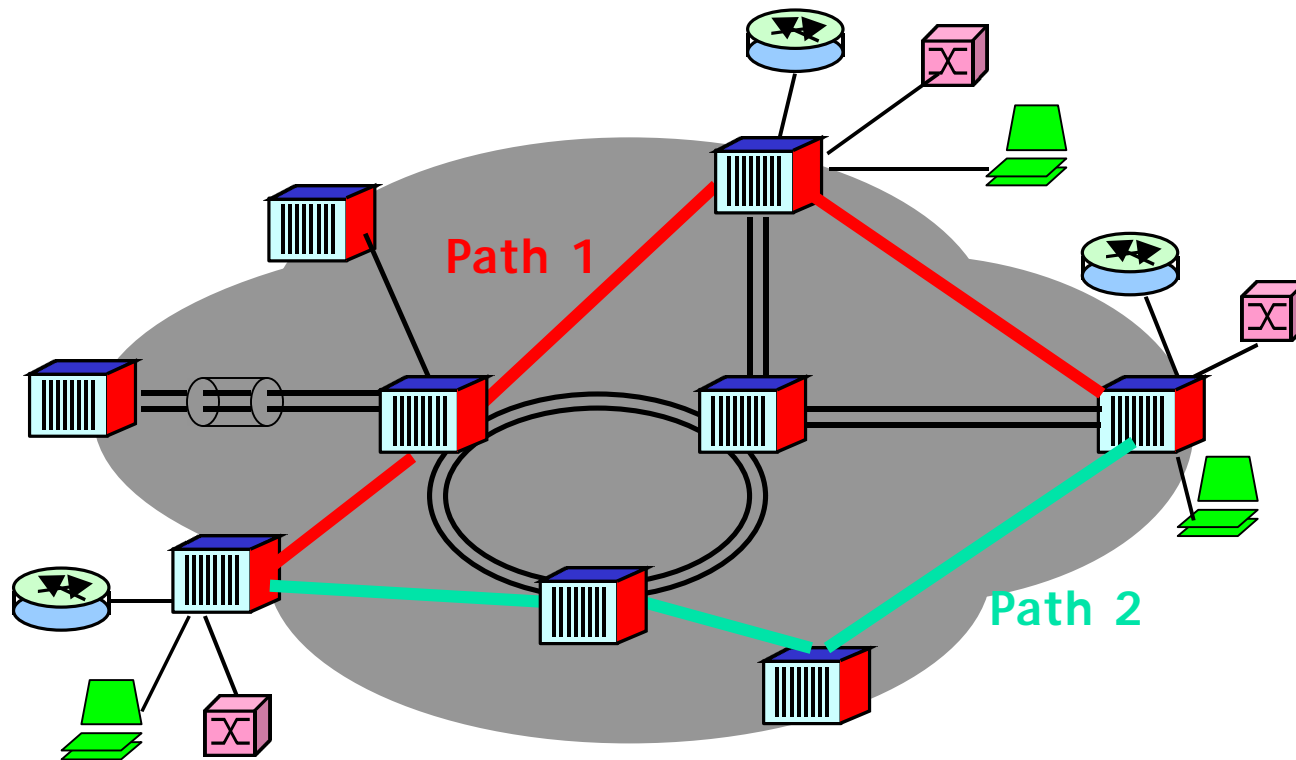
- Group of links sharing the same risk
- A link may be member of many SRLGs

Shared Risk Link Group



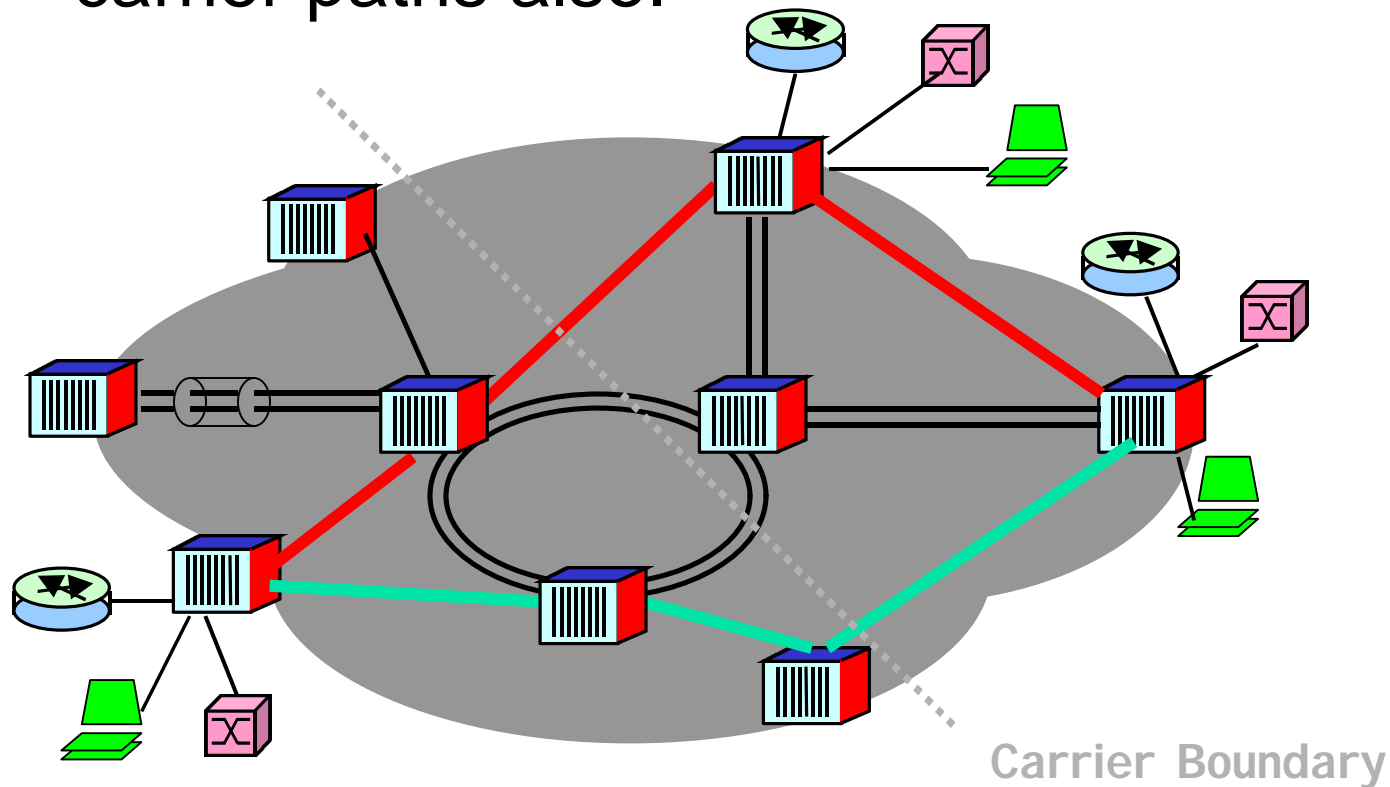
# Path Diversity

- Two paths not sharing the same risk
  - Setup(Path2, diverse from path1)



## Path Diversity (Cont)

- Diversity requirement may apply across multi-carrier paths also.



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## Goals

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- Automate path computation for diversity and risk assessment
- Reduce the amount of information exchanged:  
Summarization of SRLGs

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## Risk assessment

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- Risk assessment: Evaluation of the potential risk associated to the inclusion of a given resource in a given path.  
E.g., Risk Factor =  $P(\text{Fault})$   
Weight Factor = Preference for a resource

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## Risk Assessment Steps

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- User specifies availability requirements  
(Not in the scope of this document)
- **Assign the risk factor and weight factors to physical and logical resources**
- Propagate the above-configured information using routing protocols
- Use the above information in path computation  
E.g., Risk of path <1, 3, 5> = Risk 1 x Risk 3 x Risk 5

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# Steps in achieving diversity

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1. Topology: Rings, mesh, domains, ...
2. Constraints:
  - Inclusive: E.g., Domain topology
  - Exclusive: E.g., Link or node types
  - Limiting: E.g., Bandwidth
3. Output:
  - Path Availability
  - Maximum diverse path
  - Loose or strict route

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# Requirements

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## ■ Encoding

- Logical and physical structure in SRLG
- Summarizable encoding mechanism

## ■ Capability

- Domain, node, link capability associated to SRLG
- Risk assessment parameters
- Preferential route selection parameters

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## Extensions

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- Routing protocol
  - Domain topology and inter-domain link information propagation
  - Scoping this information to reduce flooding
- Path Computation Algorithms, e.g., CSPF
  - Extend to optimize risk and use new constraints

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## Conclusions

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- **SRLG:**
  - For diversity
  - For risk assessment
  - Applies to links, nodes, domains
- **Extensions Required for routing protocols:**
  - Propagation of SRLG information
  - Use in path computation