Shortest Path Tree ID Allocation Protocol

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Allocation Data

- SPTID
  - SPVID: 12 bits, (SPB)
  - SPSourceID: 20 bits, (SPBB)
- Static allocation data
  - Configured SPTIDs
- Dynamic allocation data
  - Auto allocated SPTIDs
- SPVID Range
  - Same in all bridges within an SPT Region
  - Ensured by MST Configuration Identifier

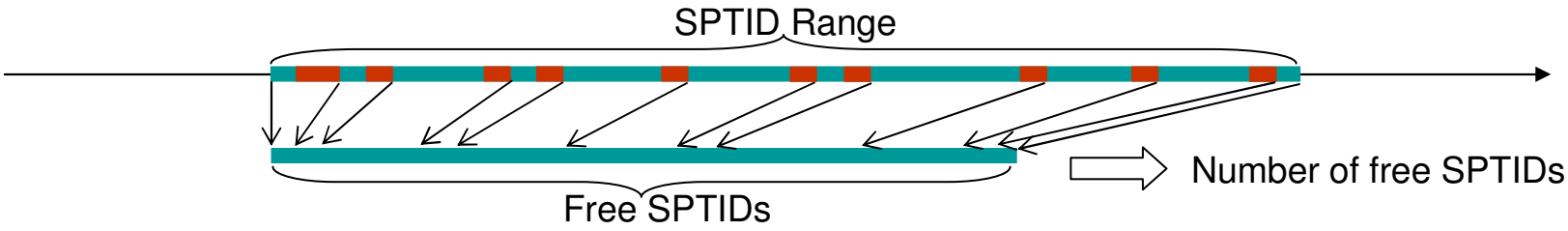
Allocation Protocol

- Existing IS-IS operation is used, allocation information is carried in SPB Instance TLV of IS-IS PDUs
- Each SPT Bridge allocates SPTIDs for itself based on
  - Bridge Identifier
  - Static and dynamic allocation data
  - LSP database
- An SPT Bridge advertises its allocations in IS-IS PDUs
- Collisions are resolved dynamically
- Allocations age with LSPs
- TAP ensures that neighbor bridges only activate changes if their digest matches
  - Consistency in SPVID allocation of neighbors is assured

Configured Allocations

- A recently configured SPTID is allocated if it is free
- A flag in the SPB Instance TLV shows whether or not an allocation is configured
- Configuration may override auto allocation
- Auto allocation is performed if the SPTID is already allocated by configuration
- IST is assigned in case of lack of SPVIDs

Auto Allocation



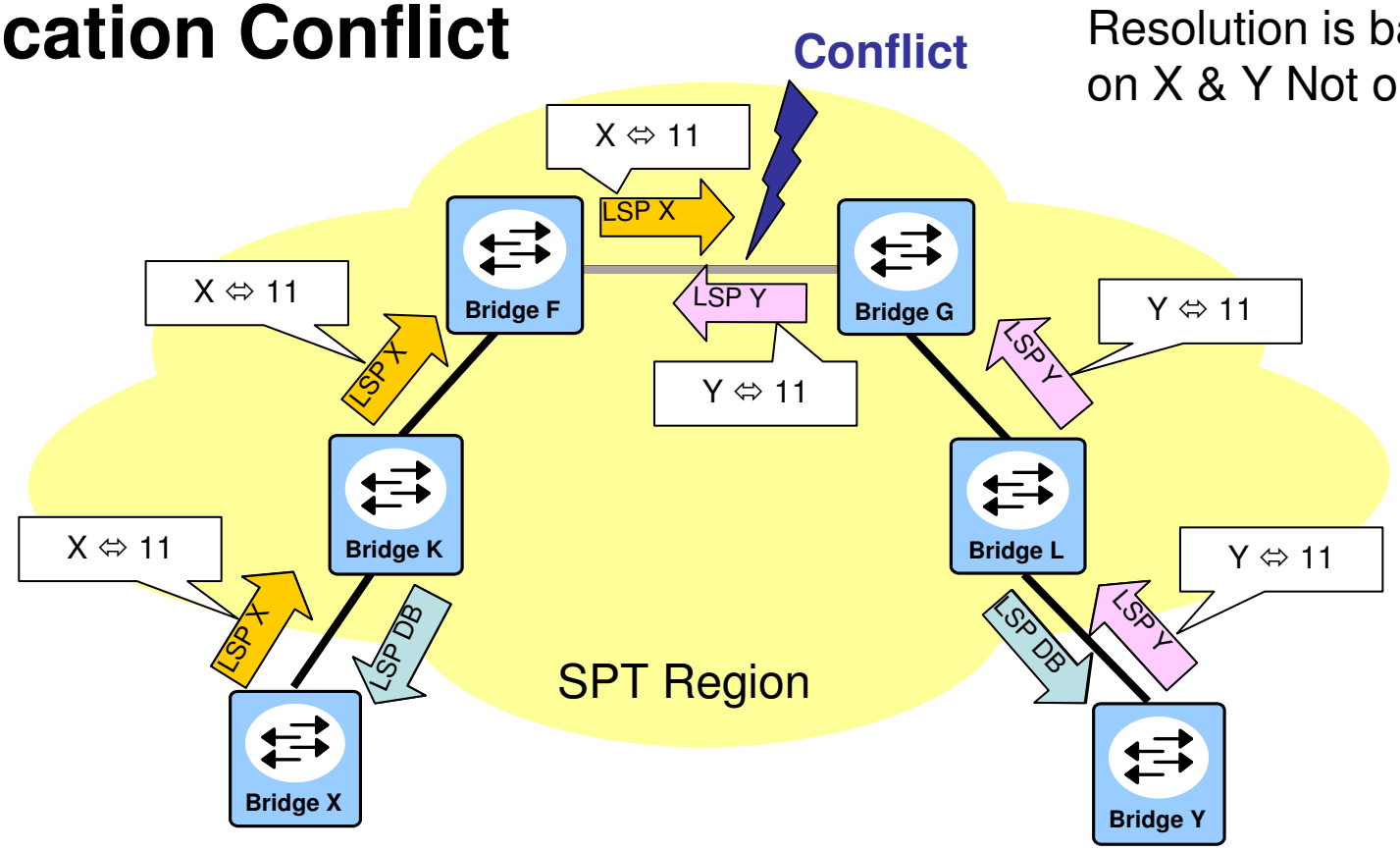
- Pseudo-random SPTID selection:
  - Modulo operation on the Bridge Identifier by the Number of free SPTIDs
  - The result indicates which element is selected from the list of the free SPTIDs
- A recently joint bridge does not perform any allocation until it acquires the LSP database
- Bridges try to reallocate former allocations
- Note
  - Different bridges may use different SPTID selection method
  - However, fewer conflicts and faster convergence might be achieved by using the same algorithm in each bridge

Conflict Resolution

- Each SPT Bridge detects conflicts individually based on IS-IS PDUs
- Each bridge is aware of which allocation is valid
- The ‘Loser’ bridge allocates another SPTID
- The Loser’s LSP is ignored, e.g. by aging it out
- Configurations have priority over auto allocation
  - Conflicting configurations are resolved based on Bridge Priority
- Conflicting auto allocations
  - Existing allocations are not taken away by new ones
  - Bridge Priority is used to resolve collision
- IST is assigned if the conflict cannot be resolved otherwise (e.g. due to lack of SPVIDs)

Bridges Attached Almost The Same Time

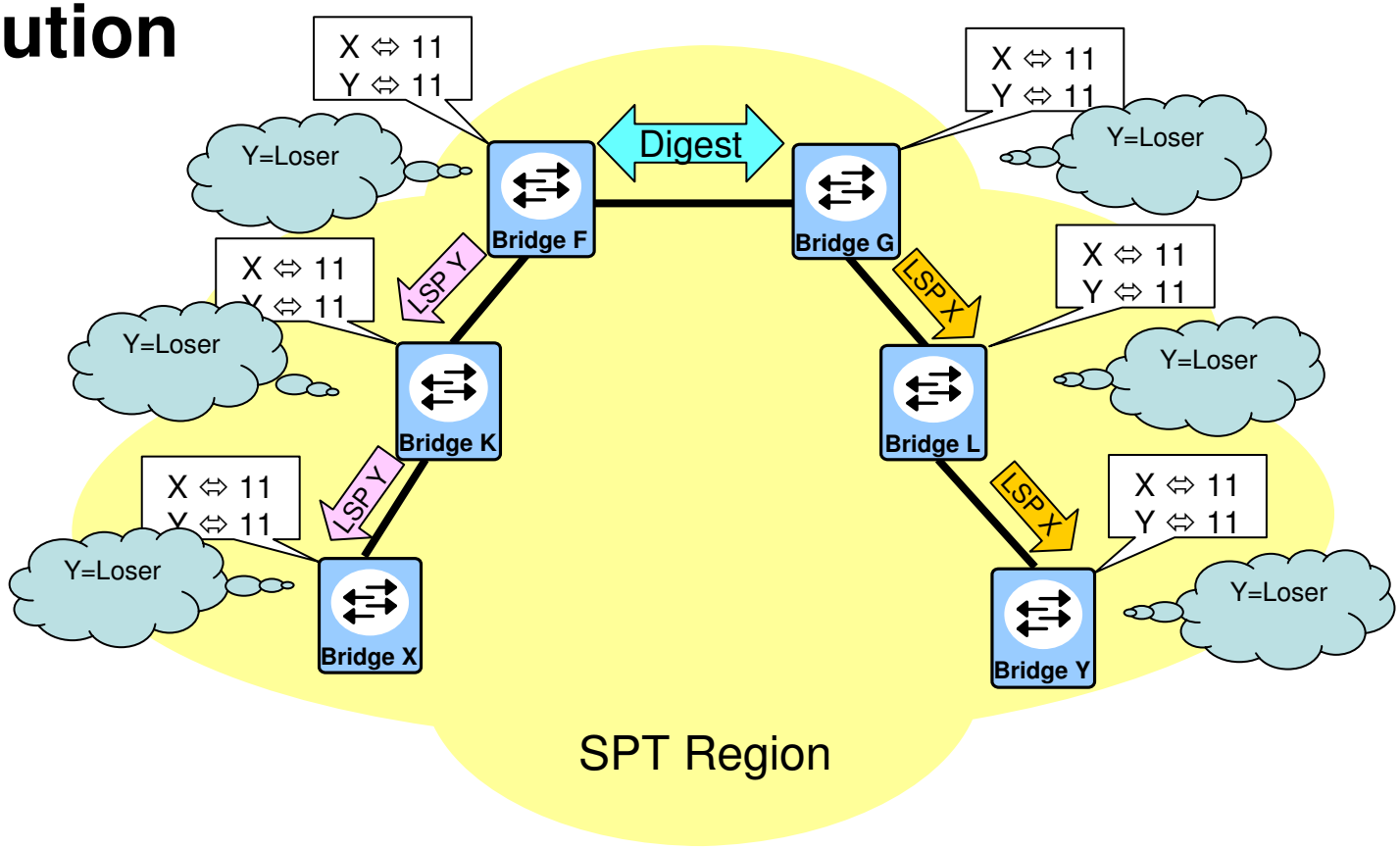
Allocation Conflict



Resolution is based only on X & Y Not on F or G

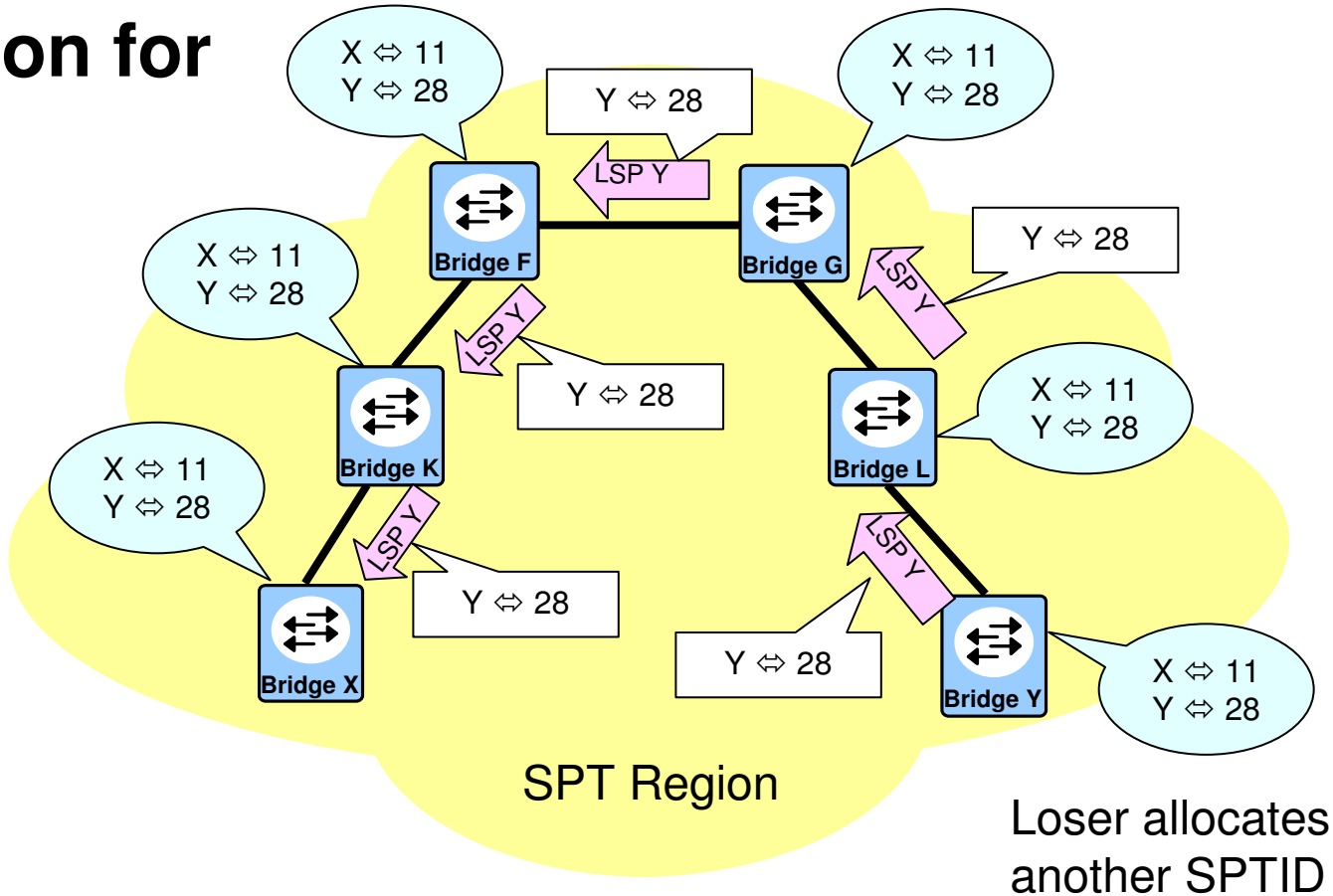
Bridges Attached Almost The Same Time

Resolution



Bridges Attached Almost The Same Time

Allocation for Loser



Loser allocates another SPTID