

## Solution Specific Boundary Conditions Proposal

Currently there is no capability to specify solution specific boundary data that would modify the application of the boundary condition or impose additional flow solution changes. For instance the ability to specify a temperature distribution or a turbulence transition distribution.

I propose that a new SolutionBC\_t node be added under the FlowSolution\_t node which can contain point by point data for modifying the solution on a point by point basis. The node would look just like the ZoneBC\_t node with all of its possible children nodes.

Parents: Base\_t/Zone\_t/FlowSolution\_t  
Name: SolutionBC  
Label: SolutionBC\_t  
Cardinality: 0,1  
Data: MT

The BC\_t node structure would be the same with the following additional children as follows:

Parents: Base\_t/Zone\_t/FlowSolution\_t/SolutionBC\_t/BC\_t  
Name: BCPointer  
Label: BCPointer\_t  
Ndims: 1  
Dimensions: LengthOfString  
Data: 'Path to a ZoneBC\_t/BC\_t node'  
Cardinality: 0,1

Note: The above node allows the user to associate the data contained in this node to an existing boundary surface. The range and other data under the node pointed to is inherited by the parent node. Similarly the data in this BC\_t node become part of the ZoneBC\_t/BC\_t node for the current flow solution. This node is used in place of the PointRange, FaceList, FaceRange and Elements# nodes. Other nodes, like DimensionalUnits, if included here override similar nodes in the ZoneBC\_t/BC\_t node.

Parents: Base\_t/Zone\_t/FlowSolution\_t/SolutionBC\_t/BC\_t  
Name: TurbulentTransition  
Label: DataArray\_t  
Ndims: Depends on range specification  
Dimensions: Depends on range specification  
Data: Real: 0.0-1.0 transition percentage (0=laminar, 1=fully turbulent)  
Cardinality: 0,1

Parents: Base\_t/Zone\_t/FlowSolution\_t/SolutionBC\_t/BC\_t  
Name: SpecifiedTemperature  
Label: DataArray\_t  
Ndims: Depends on range specification  
Dimensions: Depends on range specification  
Data: Real: Temperature value (may have DataClass and DimensionalUnits children)  
Cardinality: 0,1

Note that the data has the same size, dimension values and order as the BC range specification and thus maintains 1 to 1 correspondence.