

## Multiple families declaration in Zones, ZoneSubRegions and Boundary Conditions

This is version 0.5, taking into comments and modifications received from:

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Specific Q&A can be found at the end of the proposal.

This proposal is a modification of the use of family-referencing nodes under *Zone\_t*, *ZoneSubRegion\_t*, and *BC\_t*. We propose to allow the new *AdditionalFamilyName\_t* nodes, as a way of listing additional families that the current entity is associated to. (The existing *FamilyName\_t* node named *FamilyName* that refers to the primary family remains unchanged.) The new *AdditionalFamilyName\_t* nodes have user-defined names. Their data refer to auxiliary/additional families being associated to. The reason for allowing these additional nodes is to allow the CGNS tree to mimic some CAD related hierarchy, if desired. This expanded capability is obviously not required for most applications, but it extends the user's ability to add more logical relationships, which may enhance the ability to describe or organize complex geometries.

```
Zone_t :=
{
...
FamilyName_t FamilyName ;                               (o)

List( AdditionalFamilyName_t AdditionalFamilyName1 ... AdditionalFamilyNameN ) ; (o)

...
} ;

ZoneSubRegion_t :=
{
...
FamilyName_t FamilyName ;                               (o)

List( AdditionalFamilyName_t AdditionalFamilyName1 ... AdditionalFamilyNameN ) ; (o)

...
} ;

BC_t :=
{
...
FamilyName_t FamilyName ;                               (o)

List( AdditionalFamilyName_t AdditionalFamilyName1 ... AdditionalFamilyNameN ) ; (o)

...
} ;
```

An example is given here. Say that the *Zone\_t* Zone5 belongs to the *Family\_t* Rotor. “Rotor” would be assigned as the *FamilyName\_t* FamilyName, as usual. But the user may also want to associate *Zone5* with auxiliary families named “HubNeighbor” and “LiftSurface” for special purposes (e.g., being associated to the family “LiftSurface” may mean that the current entity contributes to the total lift). The relevant tree sections would look as follows:

```
CGNSBase_t
  Label=Family_t; name='Rotor'
  ...
  Label=Family_t; name='HubNeighbor'
  ...
  Label=Family_t; name='LiftSurface'
  ...
  Label=Zone_t; name='Zone5'
    Label=FamilyName_t; name='FamilyName'; data='Rotor'
    Label=AdditionalFamilyName_t; name='Nearby'; data='HubNeighbor'
    Label=AdditionalFamilyName_t; name='Forces'; data='LiftSurface'
    ...
```