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-- file P4Defs.Mesa
-- last modified by Satterthwaite, July 16, 1978 10:19 AM

DIRECTORY
  ControlDefs: FROM "controldefs",
  SymDefs: FROM "symdefs",
  TableDefs: FROM "tabledefs",
  TreeDefs: FROM "treedefs";

P4Defs: DEFINITIONS =
  BEGIN
    OPEN TreeDefs, SymDefs;

    P4Mark: BOOLEAN = FALSE;

    -- representations (temporary)

    Repr: TYPE = [none..other+both];
      none: CARDINAL = 0;
      signed: CARDINAL = 1;
      unsigned: CARDINAL = 2;
      other: CARDINAL = 4;
      both: CARDINAL = signed+unsigned;

    -- notifiers

    BCDNotify, DeclNotify, LayoutNotify, StmtNotify: TableDefs.TableNotifier;
    ExpANotify, ExpBNotify: TableDefs.TableNotifier;

    -- exported by Pass4B

    AssignImports: TreeScan;
    InitBCD: PROCEDURE;
    FinishBCD: PROCEDURE;
    MakeEPLink: PROCEDURE [ep: CARDINAL, gfi: ControlDefs.GFTIndex] RETURNS [ControlDefs.ControlLink];
    ProcessExports: TreeMap;
    ProcessImports: TreeScan;

    -- exported by Pass4D

    AssignableRanges: PROCEDURE [CSEIndex, CSEIndex] RETURNS [BOOLEAN];
    BiasForType: PROCEDURE [CSEIndex] RETURNS [INTEGER];
    ComparableRanges: PROCEDURE [CSEIndex, CSEIndex] RETURNS [BOOLEAN];
    DeclItem: TreeScan;
    DeclUpdate: TreeMap;
    RepForType: PROCEDURE [CSEIndex] RETURNS [Repr];
    TypeExp: PROCEDURE [typeExp: TreeLink, body: BOOLEAN];
    TypeForTree: PROCEDURE [TreeLink] RETURNS [SEIndex];
    WordsForType: PROCEDURE [CSEIndex] RETURNS [CARDINAL];

    -- exported by Pass4L

    ArgLength: PROCEDURE [SEIndex] RETURNS [CARDINAL];
    AssignEntries: PROCEDURE [BTIndex];
    AssignLocalDescriptors: PROCEDURE [BTIndex, CARDINAL] RETURNS [CARDINAL];
    BitsForType: PROCEDURE [SEIndex] RETURNS [CARDINAL];
    LayoutArgs: PROCEDURE [recordCSEIndex, CARDINAL, BOOLEAN] RETURNS [CARDINAL];
    LayoutBlock: PROCEDURE [BTIndex, CARDINAL] RETURNS [CARDINAL];
    LayoutFields: PROCEDURE [recordCSEIndex, CARDINAL];
    LayoutGlobals: PROCEDURE [CBTIndex] RETURNS [CARDINAL];
    LayoutInterface: PROCEDURE [CBTIndex] RETURNS [CARDINAL];
    LayoutLocals: PROCEDURE [CBTIndex] RETURNS [CARDINAL];

    -- exported by Pass4S

    Binding: PROCEDURE [TreeIndex, NodeName, TreeMap] RETURNS [TreeLink];
    BodyList: PROCEDURE [BTIndex];
    CaseDriver: PROCEDURE [TreeIndex, TreeMap] RETURNS [TreeLink];
    CatchNest: PROCEDURE [TreeLink];

    -- exported by Pass4Xa

    Assignment: PROCEDURE [TreeIndex] RETURNS [TreeLink];
    Call: PROCEDURE [TreeIndex] RETURNS [TreeLink];
    Construct: PROCEDURE [TreeIndex] RETURNS [TreeLink];
    Fork: PROCEDURE [TreeIndex] RETURNS [TreeLink];
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MakeArgRecord: PROCEDURE [recordCSEIndex, TreeLink] RETURNS [TreeLink];
New: PROCEDURE [TreeIndex] RETURNS [TreeLink];
PushAssignment: PROCEDURE [id, val: TreeLink, type: CSEIndex];
ResolveSizes: PROCEDURE [TreeLink, CSEIndex] RETURNS [TreeLink];
RowConstruct: PROCEDURE [TreeIndex] RETURNS [TreeLink];
TargetRep: PROCEDURE [Repr] RETURNS [Repr];
Union: PROCEDURE [TreeIndex] RETURNS [TreeLink];
UnpackElement: PROCEDURE [TreeLink, CARDINAL] RETURNS [TreeLink];
UnpackField: PROCEDURE [TreeLink, ISEIndex] RETURNS [TreeLink];
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-- exported by Pass4Xb
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Pass4XInit: PROCEDURE;
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AdjustBias: PROCEDURE [TreeLink, INTEGER] RETURNS [TreeLink];
Compare: PROCEDURE [l, r: WORD, rep: Repr] RETURNS [INTEGER];
ConstantInterval: PROCEDURE [TreeIndex] RETURNS [origin, range: INTEGER];
Exp: PROCEDURE [TreeLink, Repr] RETURNS [TreeLink];
ForceType: PROCEDURE [TreeLink, CSEIndex] RETURNS [TreeLink];
Interval: PROCEDURE [TreeIndex, INTEGER, Repr] RETURNS [BOOLEAN];
MakeStructuredLiteral: PROCEDURE [val: WORD, type: CSEIndex] RETURNS [TreeLink];
NeutralExp: TreeMap;
OperandType: PROCEDURE [TreeLink] RETURNS [CSEIndex];
MakeTreeLiteral: PROCEDURE [WORD] RETURNS [TreeLink];
Range: PROCEDURE [t: TreeLink, bias: INTEGER, rep, target: Repr] RETURNS [TreeLink];
RValue: PROCEDURE [exp: TreeLink, bias: INTEGER, target: Repr] RETURNS [TreeLink];
TreeLiteral: PROCEDURE [TreeLink] RETURNS [BOOLEAN];
TreeLiteralValue: PROCEDURE [TreeLink] RETURNS [WORD];
VBias: PROCEDURE RETURNS [INTEGER];
VPop: PROCEDURE;
VPush: PROCEDURE [bias: INTEGER, rep: Repr];
VRep: PROCEDURE RETURNS [Repr];

MixedRepresentation: SIGNAL;
EmptyInterval: SIGNAL;
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-- the global frames
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Pass4B, Pass4D, Pass4L, Pass4S, Pass4Xa, Pass4Xb: PROGRAM;
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END.
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