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WTF is BuildContext?

So how exactly a widget lands on a screen?

Widget

“Describes the configuration for an Element.”

```
@protected
@factory
Element createElement();
```

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StatelessWidget

“A widget that does not require mutable state”

```
@override
StatelessElement createElement() => StatelessElement(this);
```

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StatefulWidget

“A widget that has mutable state”

```
@override
StatefulElement createElement() => StatefulElement(this);
```

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Widgets are immutable

Widgets can’t hold any reference to the tree

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Same Widget can be used in multiple subtrees

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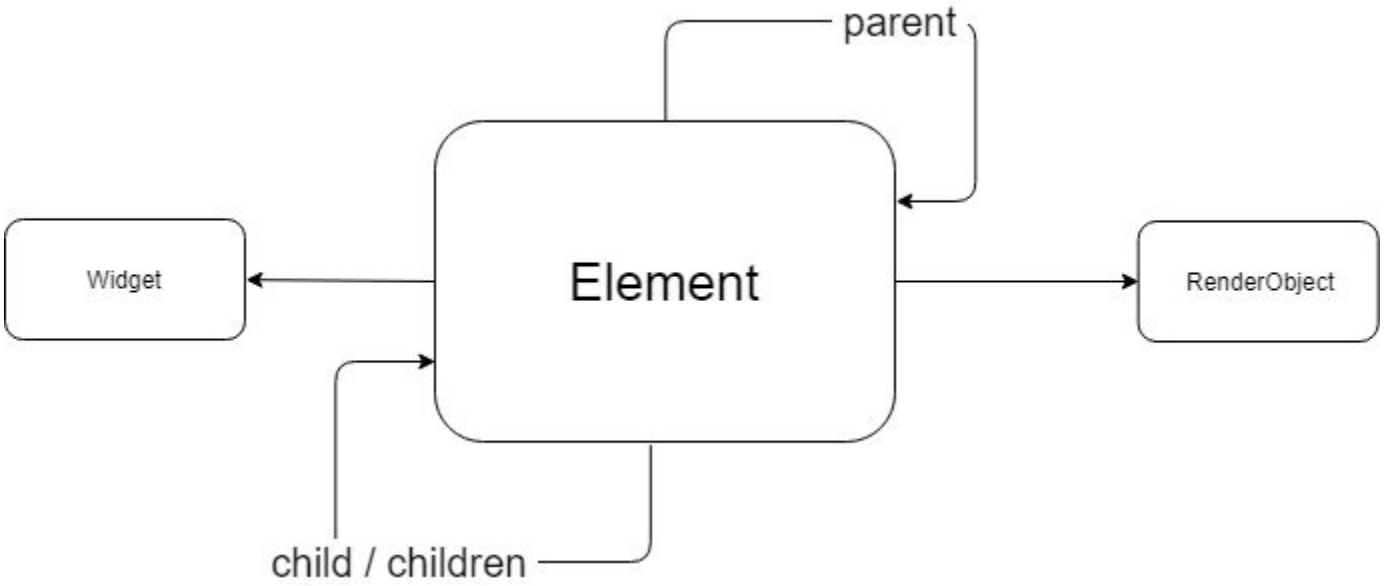
Element

“An instantiation of a Widget at a particular location in the tree.”



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Element

Element always has a RenderObject at or below its location.

```
RenderObject? get renderObject {
  RenderObject? result;
  void visit(Element element) {
    assert(result == null); // this verifies that there's only one child
    if (element is RenderObjectElement)
      result = element.renderObject;
    else
      element.visitChildren(visit);
  }
  visit(this);
  return result;
}
```

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Element could either be:
ComponentElement
RenderObjectElement

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StatelessElement

```
@override
Widget build() => widget.build(this);
```

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StatefulElement

```
@override
Widget build() => state.build(this);
```

RenderObject

```
@protected
void performLayout();
```

```
void paint(PaintingContext context, Offset offset) { }
```

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RenderObject

```dart
@override
void performLayout() {
  final BoxConstraints constraints = this.constraints;
  _resolve();
  assert(_resolvedPadding != null);
  if (child == null) {
    size = constraints.constrain(Size(
      _resolvedPadding!.left + _resolvedPadding!.right,
      _resolvedPadding!.top + _resolvedPadding!.bottom,
    ));
    return;
  }
  final BoxConstraints innerConstraints = constraints.deflate(_resolvedPadding!);
  child!.layout(innerConstraints, parentUsesSize: true);
  final BoxParentData childParentData = child!.parentData! as BoxParentData;
  childParentData.offset = Offset(_resolvedPadding!.left, _resolvedPadding!.top);
  size = constraints.constrain(Size(
    _resolvedPadding!.left + child!.size.width + _resolvedPadding!.right,
    _resolvedPadding!.top + child!.size.height + _resolvedPadding!.bottom,
  ));
}
```

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InheritedWidget

```
T? dependOnInheritedWidgetOfExactType<T extends InheritedWidget>(
        {Object? aspect}
)
```

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InheritedWidget - Theme example

```
static ThemeData of(BuildContext context) {
  final _InheritedTheme? inheritedTheme = context.dependOnInheritedWidgetOfE
  final MaterialLocalizations? localizations = Localizations.of<MaterialLoca
  final ScriptCategory category = localizations?.scriptCategory ?? ScriptCat
  final ThemeData theme = inheritedTheme?.theme.data ?? _kFallbackTheme;
  return ThemeData.localize(theme, theme.typography.geometryThemeFor(categor
}
```

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InheritedWidget - actually it’s not like that

```dart
@override
T? dependOnInheritedWidgetOfExactType<T extends InheritedWidget>({Object? aspect}) {
  assert(_debugCheckStateIsActiveForAncestorLookup());
  final InheritedElement? ancestor = _inheritedWidgets == null ? null : _inheritedWidgets![T];
  if (ancestor != null) {
    return dependOnInheritedElement(ancestor, aspect: aspect) as T;
  }
  _hadUnsatisfiedDependencies = true;
  return null;
}
```

Provider

```dart
class MyWidget extends StatelessWidget {
  const MyWidget({Key? key}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return Provider<int>.value(
      value: 5,
      child: Column(
        children: [
          Text('number is ${Provider.of<int>(context)}'),
          Text('number is ${context.watch<int>()}'),
        ],
      ), // Column
    ); // Provider.value
  }
}
```

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So how it works?

```dart
@protected
void setState(VoidCallback fn) {
  final Object? result = fn() as dynamic;
  _element!.markNeedsBuild();
}
```

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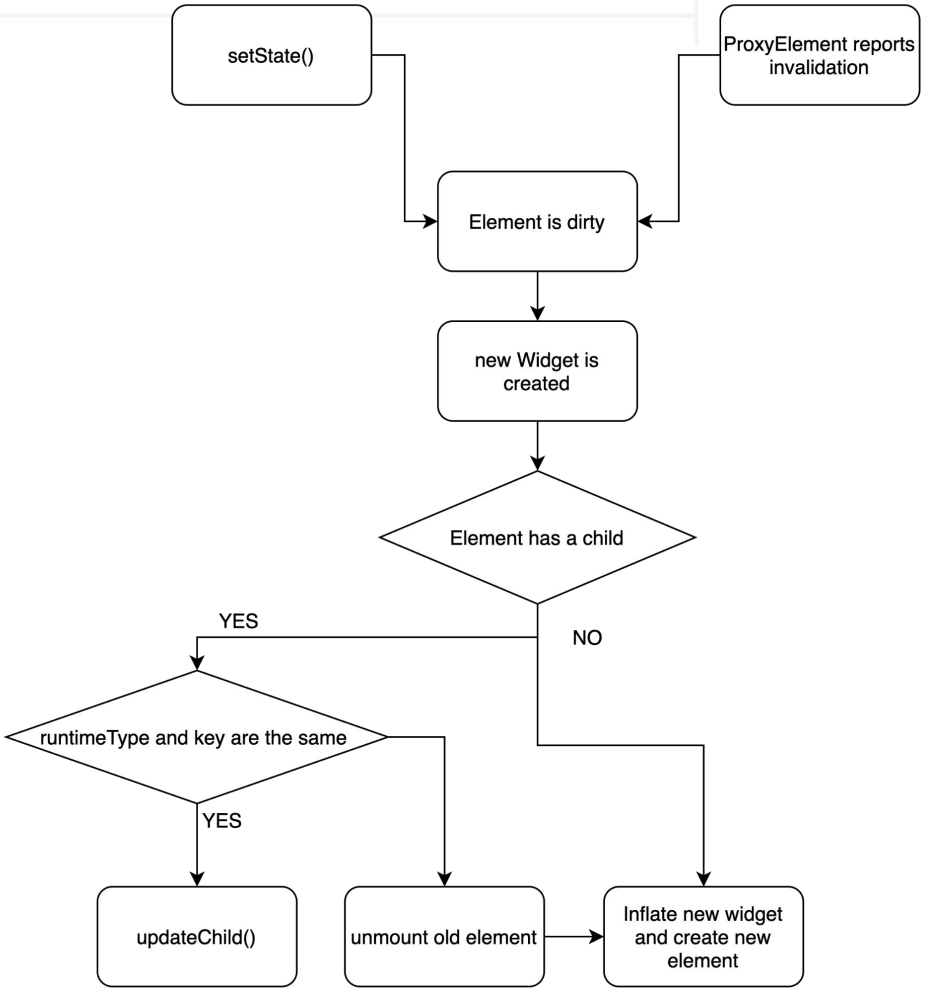

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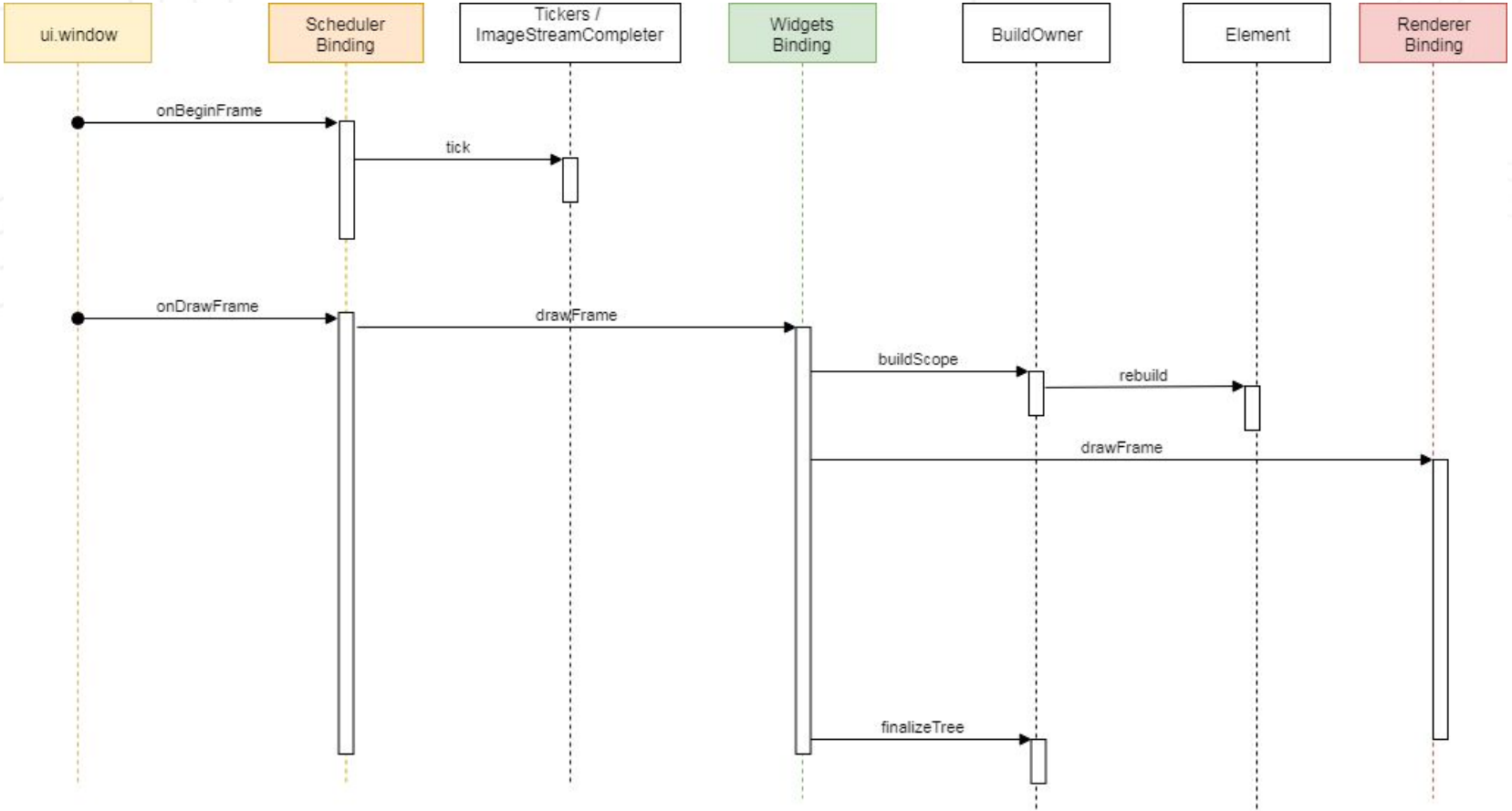

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BuildContext is just an Element

Thanks