redhat.

More Songs About Building and Foot

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Where we stand with C++11/14

- Since LibreOffice 5.1: GCC 4.7, MSVC 2013
- MSVC 2015 (GCC 4.8) would bring:
  - constexpr (partial; HAVE_CXX11_CONSTEXPR)
  - ref-qualifiers (HAVE_CXX11_REF_QUALIFIER)
  - thread-safe statics (HAVE_THREADSAFE_STATICS)
  - Inheriting constructors
  - noexcept
  - Unicode string literals: `s.replaceAll(u"na\u00EFve", "clever")`
    - already for single-char literals: `s.replaceAll(OUStringLiteral1(0x2117), "(P)")`
- Not much energy currently put into a baseline bump, though

C++17 Sugar

- Decomposition declarations:

```
auto [it, ins] = s.insert(n);
```

- Initializers in if statements:

```
if (auto [it, ins] = s.insert(n); !ins) {
    std::cout << *it << " already present\n";
}
```

instead of

```
std::pair<std::set<int>::iterator, bool> ins = s.insert(n);
if (!ins.second) {
    std::cout << *ins.first << " already present\n";
}
```

C++17 Sugar

- Constexpr if:

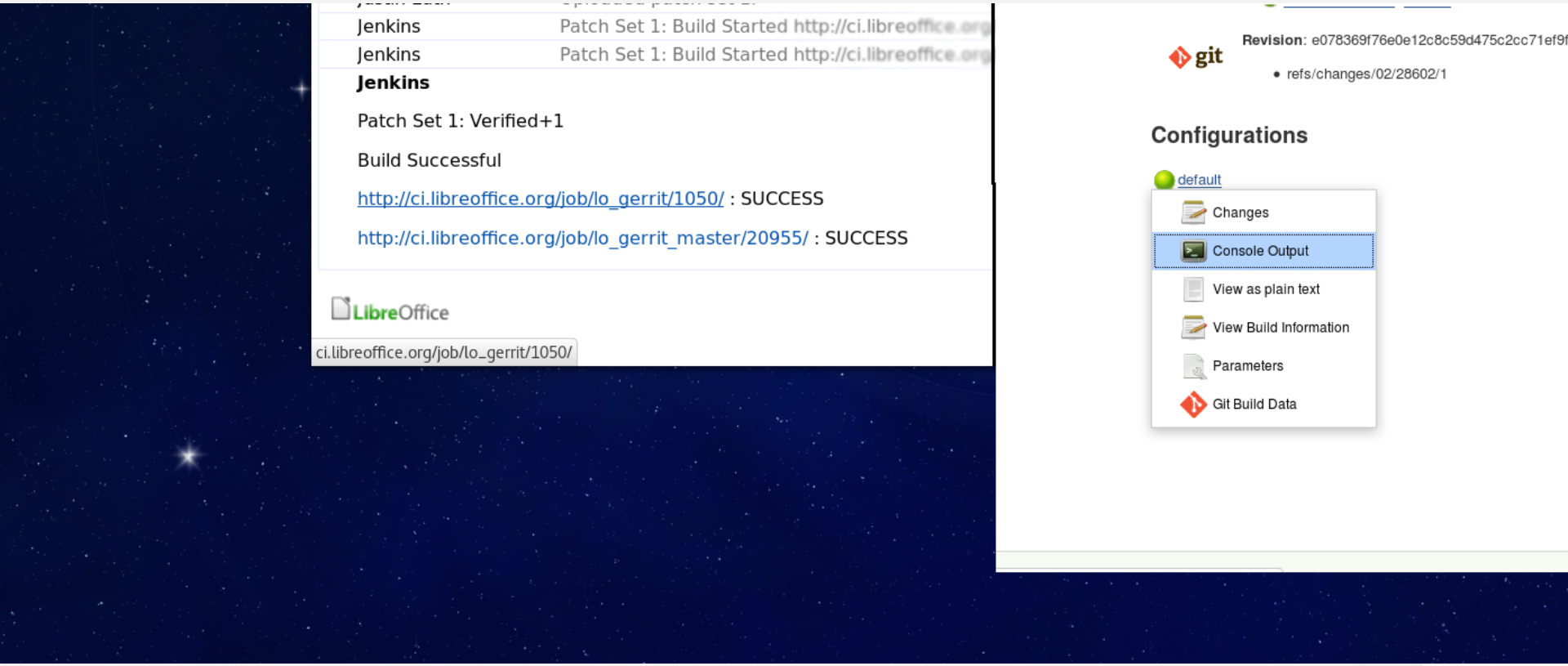
```
template<typename T> bool isNonNegative(T value) {
    if constexpr (std::is_signed<T>::value) {
        return value >= 0;
    } else {
        return true;
    }
}
```

instead of

```
template<typename T> typename
std::enable_if<std::is_signed<T>::value, bool>::type
isNonNegative(T value) { return value >= 0; }

template<typename T> typename
std::enable_if<std::is_unsigned<T>::value, bool>::type
isNonNegative(T value) { return true; }
```

Gerrit loplugin buildbot



You must be careful in the forest
Broken glass and rusty nails
If you're to bring back something for us
I have bullets for sale

Tom Waits/William Burroughs

auto, revisited

What is bad about the following?

```
std::map<OUString, OUString> aLabels = ...;
for (std::pair<OUString, OUString> const & rLabel: aLabels)
    ...
```

auto, revisited

What is bad about the following?

```
std::map<OUString, OUString> aLabels = ...;
for (std::pair<OUString, OUString> const & rLabel: aLabels)
    ...
```

Copying, that's what:

```
std::pair<OUString const, OUString> const & tmp
    = *aLabels.begin();
std::pair<OUString, OUString> const & rLabel = tmp;
```

auto, revisited

What is bad about the following?

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std::map<OUString, OUString> aLabels = ...;
for (std::pair<OUString, OUString> const & rLabel: aLabels)
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Copying, that's what:

```
std::pair<OUString const, OUString> const & tmp
    = *aLabels.begin();
std::pair<OUString, OUString> const & rLabel = tmp;
```

Easy fix:

```
for (auto const & rLabel : aLabels)
```

What's a transparent container?

Consider

```
struct Item { OUString id; ... };

~~std::map<OUString, Item> items;~~
std::set<Item> items;

Item getItem(OUString const & id) {
    return items.???();
}
```

What's a transparent container?

Pre 3d97b2000979200db53f77db20e882e85c66c0b6:

```
struct Item { OUString id; ... };

std::set<Item> items;

static Item findItem;
Item getItem(OUString const & id) {
    findItem.id = id;
    return *items.find(findItem);
}
```

What's a transparent container?

C++11:

```
struct Item { OUString id; ... };

std::set<Item> items;

Item getItem(OUString const & id) {
    return *std::find_if(
        items.begin(), items.end(),
        [id](Item const & i) { return i.id == id; });
}
```

What's a transparent container?

C++14:

```
struct Item { OUString id; ... };
bool operator <(Item const &, OUString const &);
bool operator <(OUString const &, Item const &);

std::set<Item, std::less<>> items;

Item getItem(OUString const & id) {
    return *items.find(id);
}
```

What's a transparent container?

The innocuous little

```
std::set<Item, std::less<>> items;
```

instead of the default

```
std::set<Item, std::less<Item>> items;
```

marks it as a C++ *transparent container*, opting in to

```
items.find(id)
```

actually compiling.

-Werror,-Wpessimizing-move

Return Value Optimization (RVO) in action:

```
std::unique_ptr<FilterCache> FilterCache::clone() const {
    auto pClone = o3tl::make_unique<FilterCache>();
    pClone->m_lTypes = m_lTypes;
    pClone->m_lFilters = m_lFilters;
    ...
    return pClone;
}
```

-Werror,-Wpessimizing-move

Return Value Optimization (RVO) not in action:

```
std::unique_ptr<FilterCache> FilterCache::clone() const {
    auto pClone = o3tl::make_unique<FilterCache>();
    pClone->m_lTypes = m_lTypes;
    pClone->m_lFilters = m_lFilters;
    ...
    return std::move(pClone);
}
```

and same for temporaries:

```
    return std::move(FilterCache());
```

Fun trivia

Can a virtual function be defined as deleted?

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virtual void f() = delete;
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Can a pure virtual function override a non-pure one?

```
struct A { virtual void f() {} };
struct B: A { void f() override = 0; };
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Can a pure virtual function override a non-pure one?

```
struct A { virtual void f() {} };
struct B: A { void f() override = 0; };
```

Yes! (Get rid of { assert(false); /* never call this */ } implementations?)

And we know what we're knowing
But we can't say what we've seen

Talking Heads