Resolved Module TS (N4610) Issues

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1. export import M; [Richard Smith; Sep 7, 2016]

Problem
Allow “export import M;” and “export { import M; }”, with the semantics of “export module M;” in the current draft, and remove syntactic support for “export module M;”.

Resolution
Change the example in 3.1/2 to read:
```javascript
export module import std.random;
```
Modify the production `module-export-declaration` in 3.5/1 as follows:
```javascript
module-export-declaration:
  export module-declaration module-import-declaration
```
Remove the alternative `module-declaration` from fragment:
```javascript
fragment:
  module-declaration
  module-import-declaration
  declaration
```

2. import M; at interface level [Richard Smith; Sep 7, 2016]

Problem
Ban from interface unit of M.

Resolution
Add new paragraph 7.7.2/2:

A module M1 has a dependency on a module M2 if any module unit of M1 contains an import-declaration nominating M2. A module shall not have a dependency on itself. [Example:
```javascript
module M1;
import M;        // error: cannot import M in its own unit.
--end example
```
Add new paragraph 7.7.2/3

A module M1 has an interface dependency on a module M2 if the module interface unit of M1 contains an import-declaration nominating M2. A module shall not have a transitive interface dependency on itself. [Example:

```
// interface unit of M1
module M1;
import M2;
export struct A { }; // interface unit of M2
module M2;
import M3;
```

// interface unit of M3
module M3;

--end example]

3. export const int n = 5; [Richard Smith; Sep 8, 2016]

Problem
Clarify that this is allowed.

Resolution
Modify bullet (3.2) of paragraph 3.5/3 as follows:

-- a non-inline non-exported variable of non-volatile const-qualified type that is neither explicitly declared extern nor previously declared to have external linkage; or

4. Import declaration and namespace partitions [Lukasz Mendakiewicz; Nov 3, 2016]

Problem
I was reading N4610 and have a question:

```
module M;
export namespace N
{
```
struct A {}; 
} 
namespace N 
{ 
struct B {}; 
} 

7.7.1/4 says that all members of namespace-body are exported, meaning N::A.

import M;

7.7.2/1 says that import declaration adds the namespace partitions with external linkage from M to the current TU.

Namespace partition N from M contains both N::A and N::B.

So is N::B visible and can be used in the second TU or not?

Resolution
Only exported declarations from the namespace partitions are meant to be made visible.

Remove the following sentences from 7.3/1

A namespace is an optionally-named declarative region. The name of a namespace can be used to access entities declared in that namespace; that is, the members of the namespace. Unlike other declarative regions, the definition of a namespace can be split over several parts of one or more translation units. A namespace-definition is the collection of all the namespace-definitions of the same namespace in a translation unit. A namespace consists of all its namespace-partitions.

A namespace with external linkage is always exported regardless of whether any of its namespace-definition is introduced by export.

Rewrite paragraph 7.7.2/1 as follows:

An import-declaration makes exported declarations adds the namespace partitions with external linkage from the interface of the nominated module visible to name lookup in the list of namespace partitions of the current translation unit, thereby making visible the declarations in the namespaces and contexts as in the nominated module to name lookup—the declarations in the interface of the nominated module. [Note: The entities are not redeclared in the translation unit containing the import-declaration.—end note] Example:

// Interface unit of M
module M;
export namespace N 
{ 
struct A {}; 
}
namespace N {
    struct B {};
    export struct C{
        friend void f(C) {} // exported, visible only through argument-dependent lookup
    };
}

// Translation unit 2
import M;
N::A a {};    // OK.
N::B b {};    // error: ‘B’ not found in N.
void h(N::C c) {
    f(c);        // OK: N::f found via argument-dependent lookup.
    N::f(c);     // error: ‘f’ not found via qualified lookup in N.
}

--end example--