NordiaSoft

SCA as infrastructure code: A seamless migration from SCAv2.2.2 to SCAv4.1

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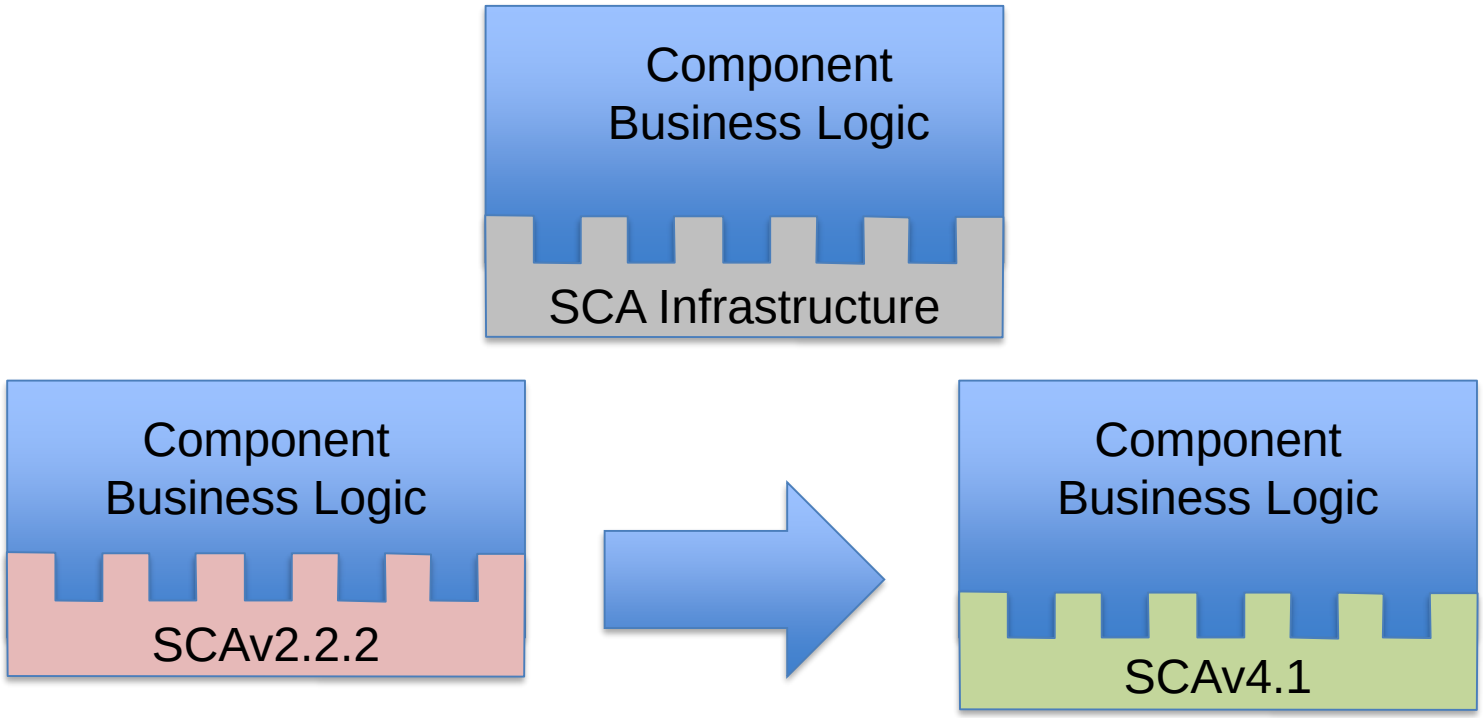


SCA as infrastructure code: A seamless migration from SCAv2.2.2 to SCAv4.1

Outline

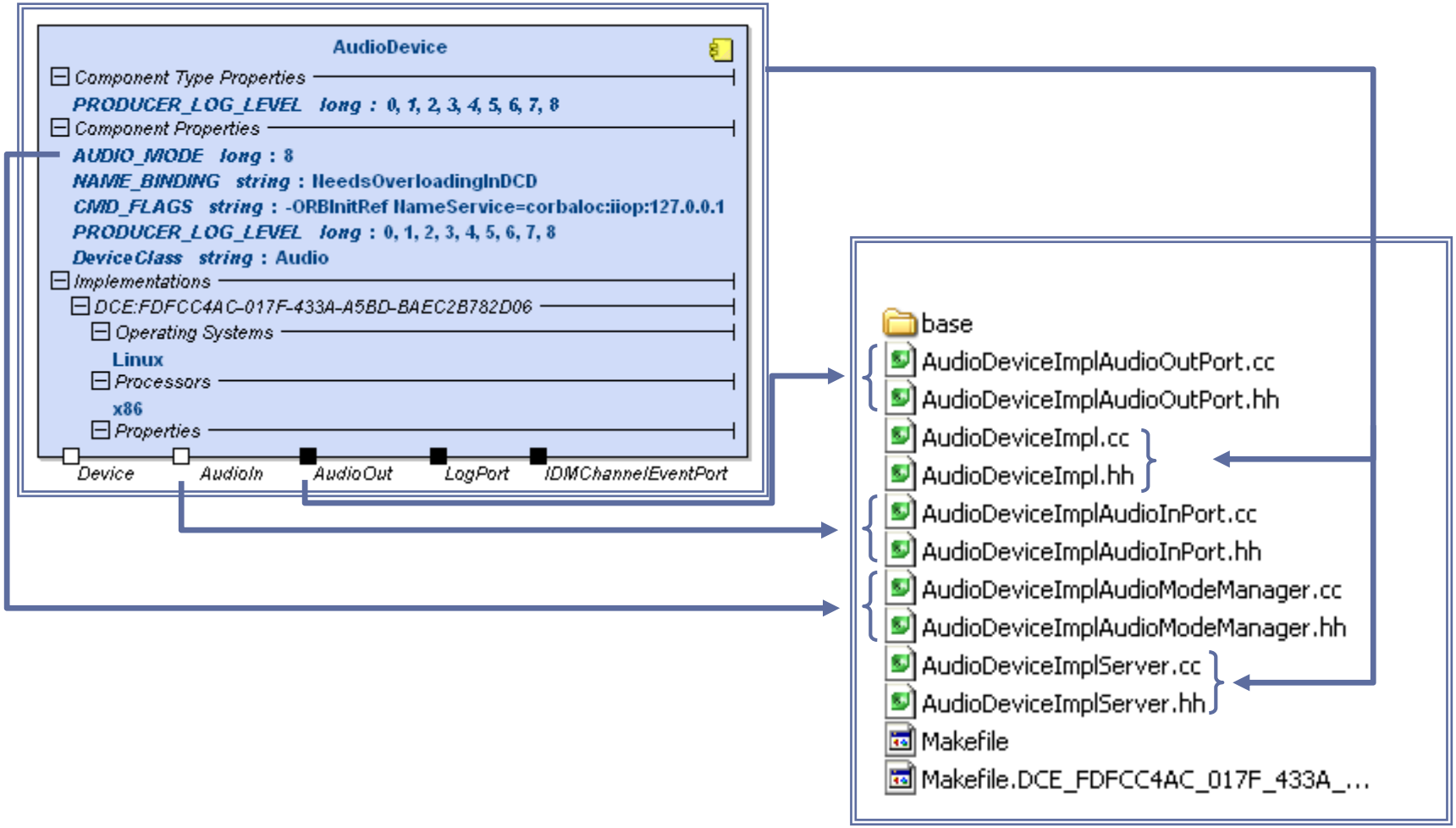
Zero Merge Code Generation

Placement of Signal Processing Business Logic

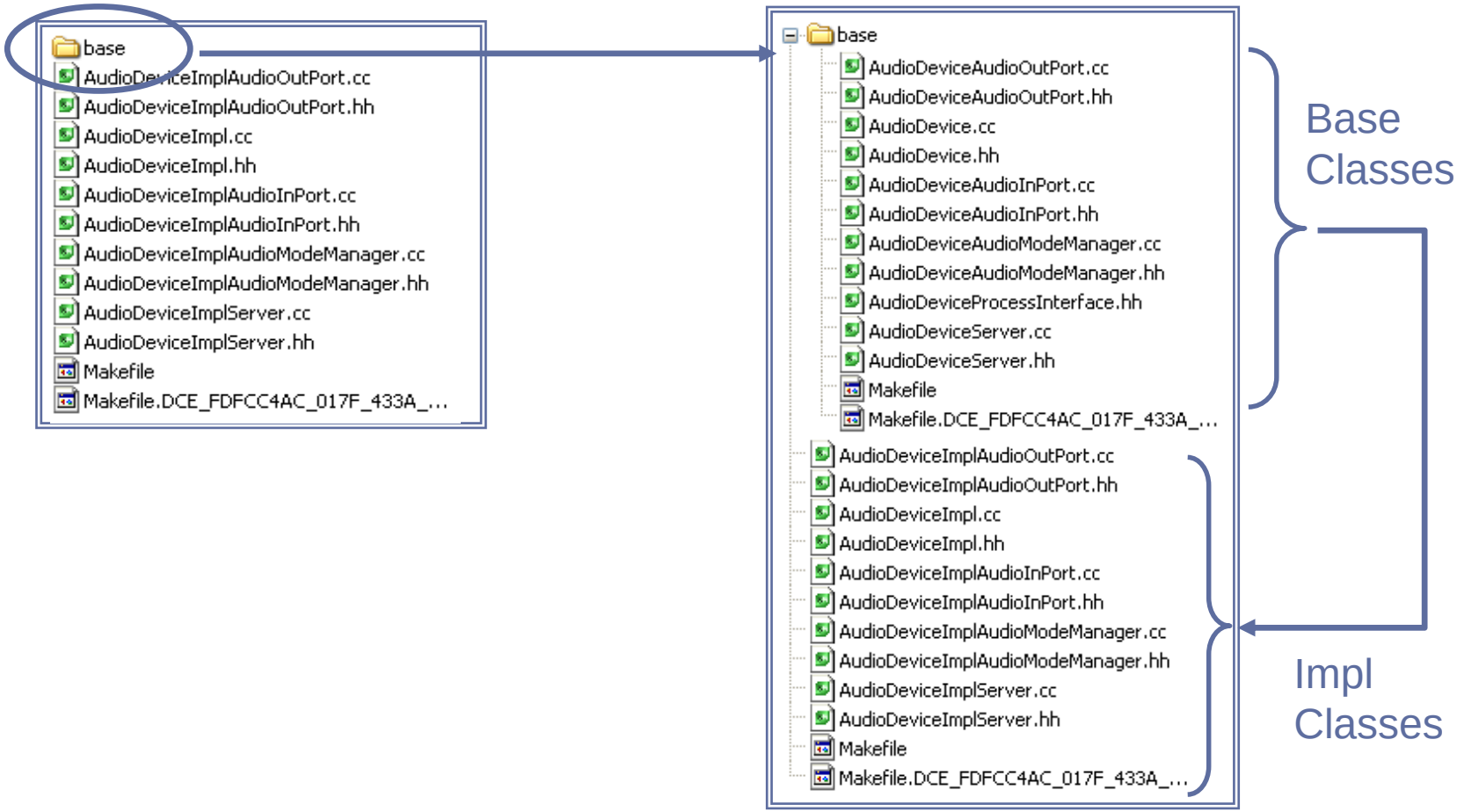
SCAv2.2.2 vs SCAv4.1 differences

Full automatic migration from SCAv2.2.2 to SCAv4.1

Zero Merge Code Generation



Zero Merge Code Generation



Zero Merge Code Generation

```
#include "AudioDeviceAudioOutPort.hh"

/**
 * Implementation of a CF::Port servant for uses port "AudioOut".
 */
class AudioDeviceImplAudioOutPort :
        public AudioDeviceAudioOutPort
{
  public:

    AudioDeviceImplAudioOutPort();

    ~AudioDeviceImplAudioOutPort();


  protected:
}; //class AudioDeviceImplAudioOutPort

#endif //AUDIODEVICEIMPLAUDIOOUTPORT_HH
```

Implementation .hh

AudioDeviceImplAudioOutPort.hh

```
/**
 * Implementation of a CF::Port servant for uses port "AudioOut".
 */
class AudioDeviceAudioOutPort :
       public POA_CF::Port,
       public Synchronizable,
       public PortableServer::RefCountServantBase
{
  public:
    PushPorts::DoubleSeqConsumer_var usedObject;

    AudioDeviceAudioOutPort();

    virtual ~AudioDeviceAudioOutPort();

    void connectPort(CORBA::Object_ptr connection, const char* connectionID)
           throw (CORBA::SystemException,
                  CF::Port::InvalidPort,
                  CF::Port::OccupiedPort);

    void disconnectPort(const char* connectionID)
           throw (CORBA::SystemException,
                  CF::Port::InvalidPort);


  protected:
    char* connectionID;
}; //class AudioDeviceAudioOutPort

#endif //AUDIODEVICEAUDIOOUTPORT_HH
```

Base .hh

AudioDeviceAudioOutPort.hh

Zero Merge Code Generation

```
#include "AudioDeviceImplAudioOutPort.hh"


/**
 * Complete constructor.
 *
 */
AudioDeviceImplAudioOutPort::AudioDeviceImplAudioOutPort() :
                    AudioDeviceAudioOutPort()
{
}

/**
 * Default Destructor
 */
AudioDeviceImplAudioOutPort::~AudioDeviceImplAudioOutPort()
{
}
```

Implementation .cc

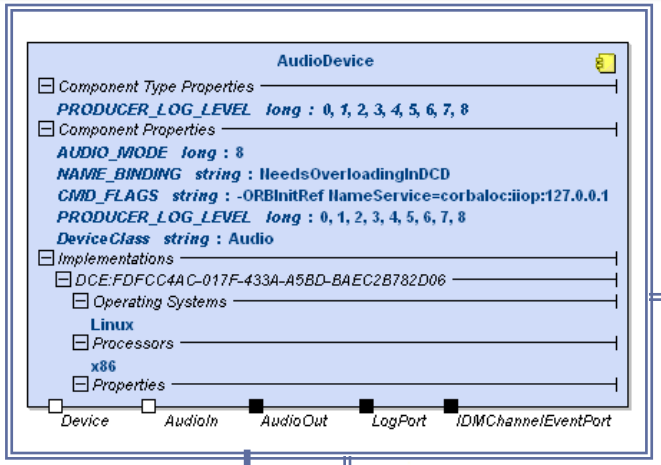
AudioDeviceImplAudioOutPort.cc

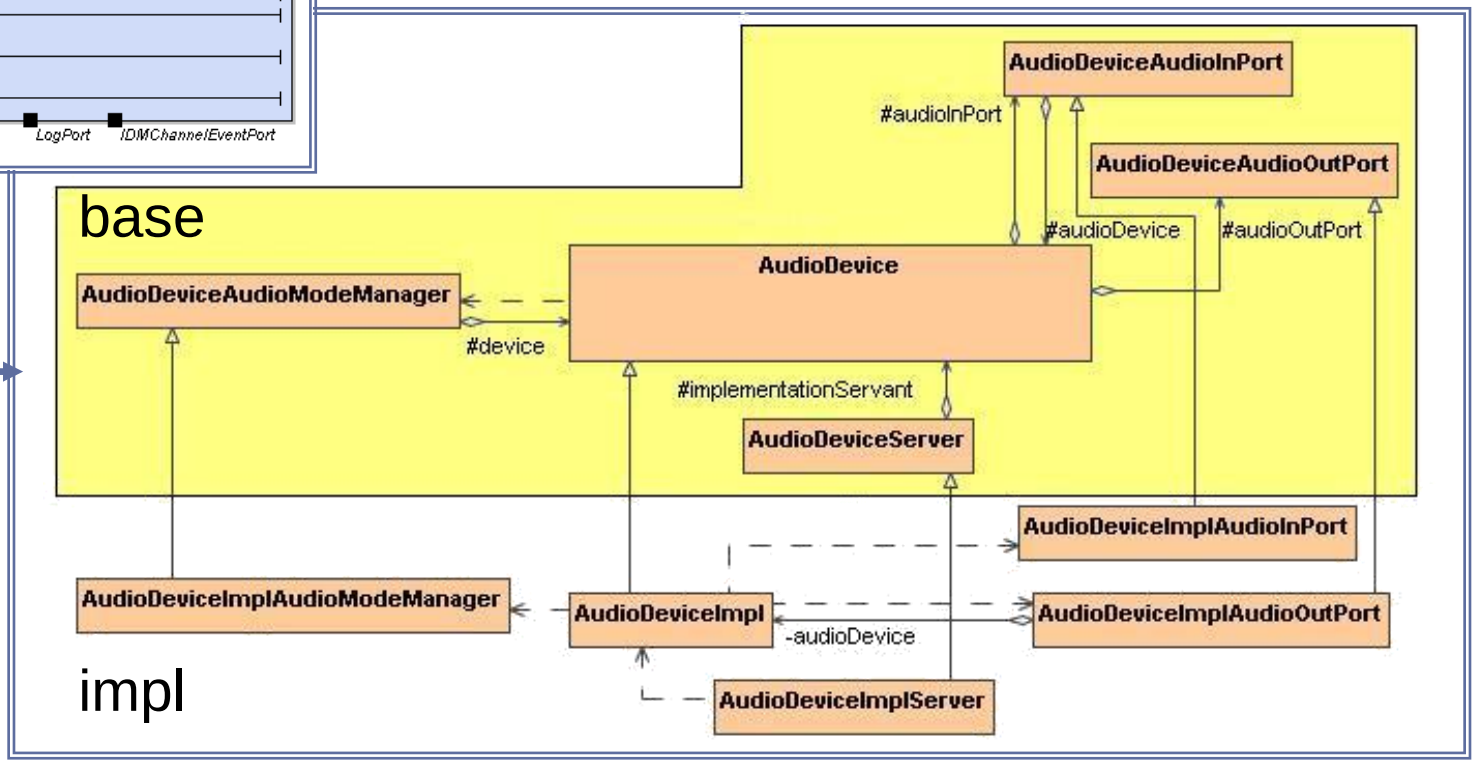
```
#include <sstream>
#include <string>
#include "AudioDeviceAudioOutPort.hh"

using namespace std;

AudioDeviceAudioOutPort::AudioDeviceAudioOutPort() :
        connectionID(0)

{
  usedObject = PushPorts::DoubleSeqConsumer::_nil();
}

AudioDeviceAudioOutPort::~AudioDeviceAudioOutPort()
{
}

void AudioDeviceAudioOutPort::connectPort(CORBA::Object_ptr connection,
                                                    const char* connectionID)
        throw (CORBA::SystemException,
               CF::Port::InvalidPort,
               CF::Port::OccupiedPort)
{
  lock();

  if(!CORBA::is_nil(usedObject))
  {
    unlock();
    throw CF::Port::OccupiedPort();
  }

  if((CORBA::is_nil(connection)) ||
     (!connection->_is_a("IDL:PushPorts/DoubleSeqConsumer:1.0")))
  {
    string msg;
    msg.append("[ AudioDeviceAudioOutPort::connectPort] Destination ");
    msg.append("component for connection id= ").append(connectionID);
    msg.append(" must be of type IDL:PushPorts/DoubleSeqConsumer:1.0");
    unlock();
    throw CF::Port::InvalidPort(1, msg.c_str());
  }

  usedObject = PushPorts::DoubleSeqConsumer::_narrow(connection);
  this->connectionID = charDup(connectionID);
  unlock();
} //connectPort
```

Base .cc

AudioDeviceAudioOutPort.cc

Zero Merge Code Generation





Outline

Zero Merge Code Generation

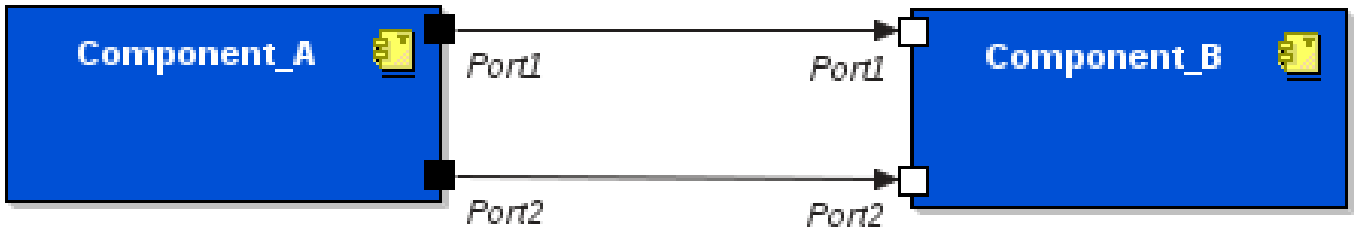
Placement of Signal Processing Business Logic

SCAv2.2.2 vs SCAv4.1 differences

Full automatic migration from SCAv2.2.2 to SCAv4.1

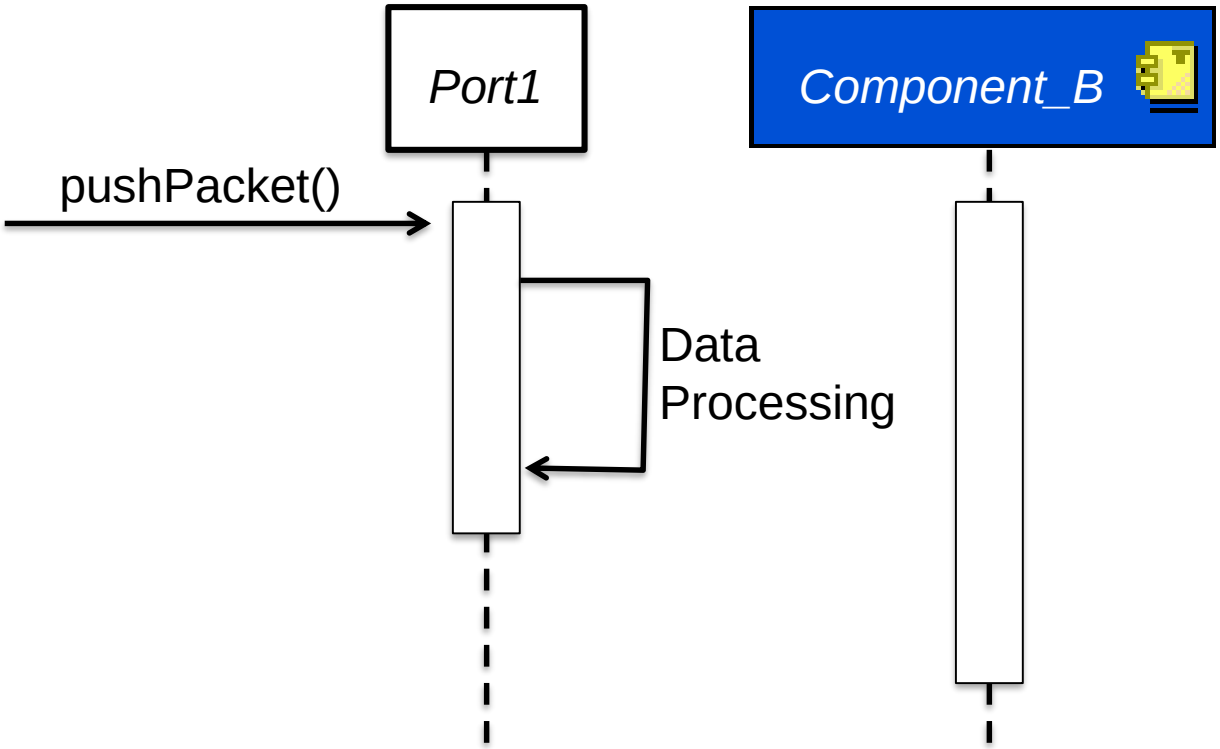
Placement of Signal Processing Business Logic

- **Embedded in the Modeling Tool**
- **At Source code level**
  - In the port receiving the data
  - In a method of the main class
  - In an external Object



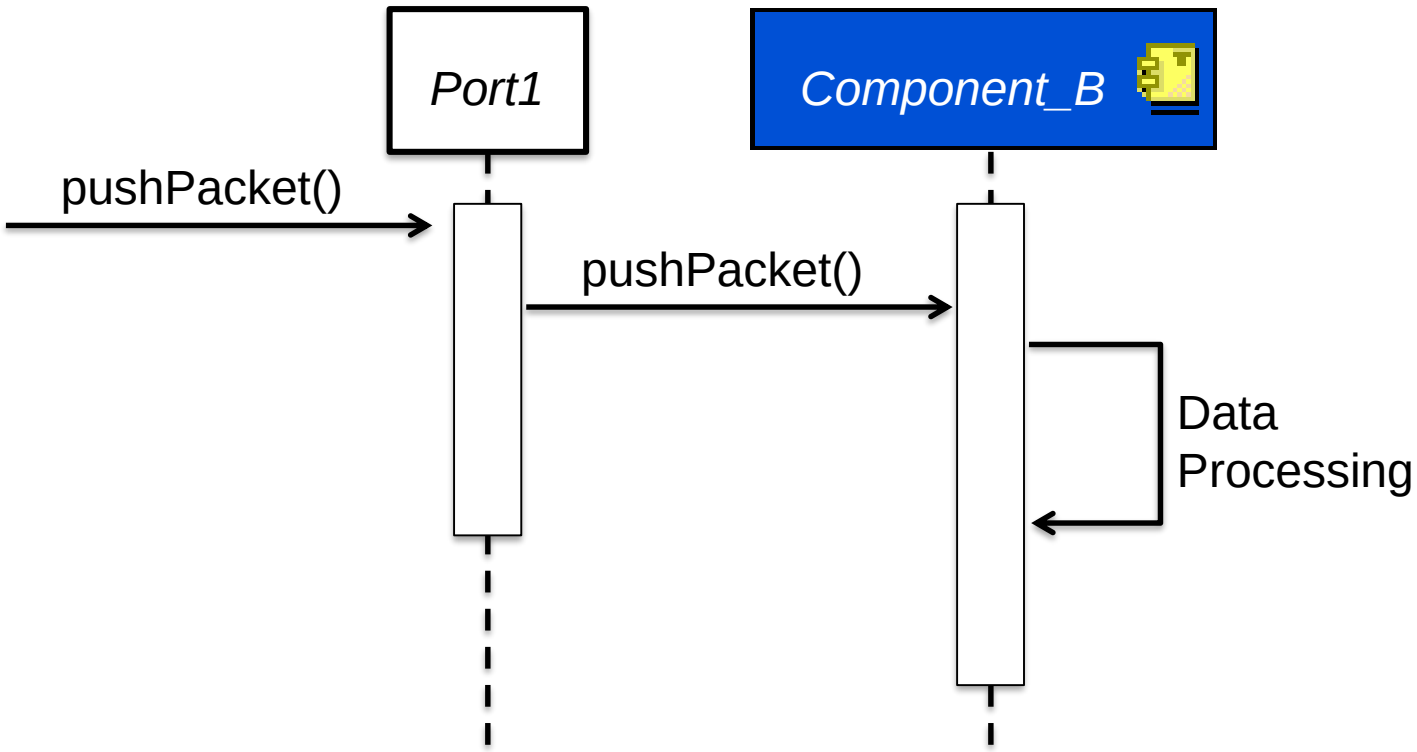
Placement of Signal Processing Business Logic

- **At Source code level**
  - In the port receiving the data



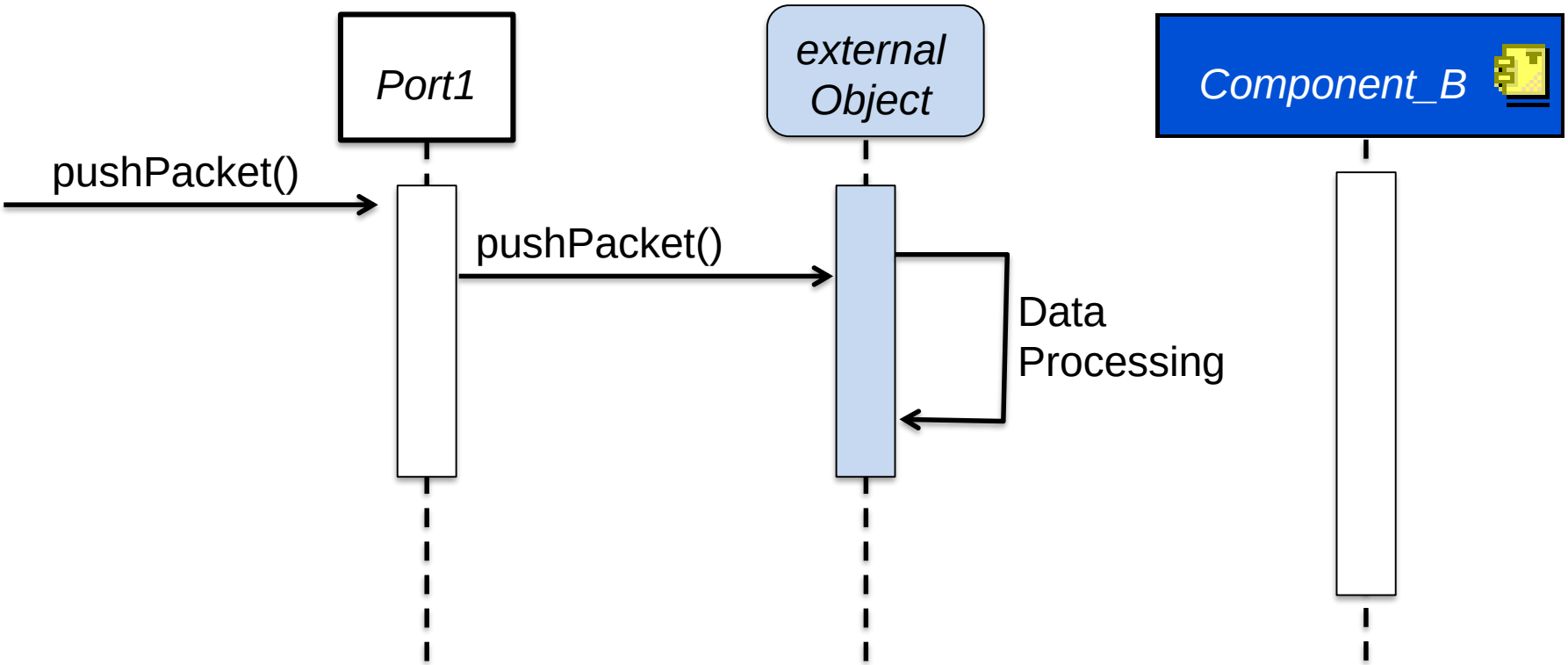
Placement of Signal Processing Business Logic

- **At Source code level**
  - In a method of the main class



Placement of Signal Processing Business Logic

- **At Source code level**
  - In an external Object



Outline

Zero Merge Code Generation

Placement of Signal Processing Business Logic

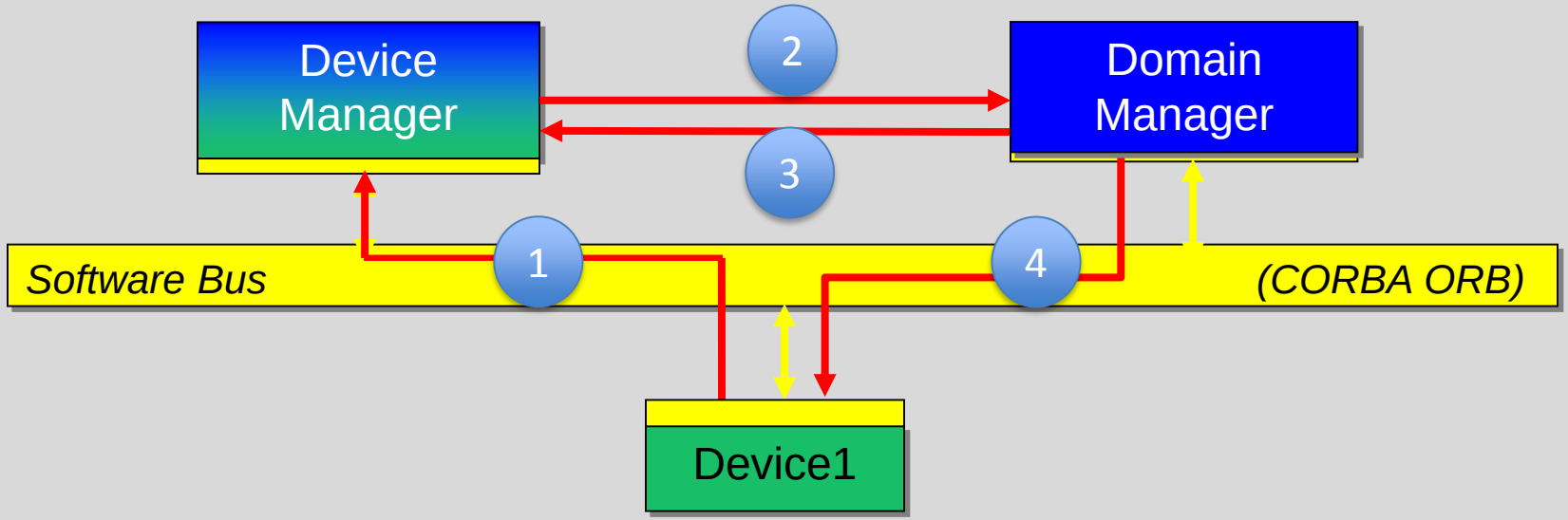
SCAv2.2.2 vs SCAv4.1 differences

Full automatic migration from SCAv2.2.2 to SCAv4.1

SCAv2.2.2 vs SCAv4.1 differences

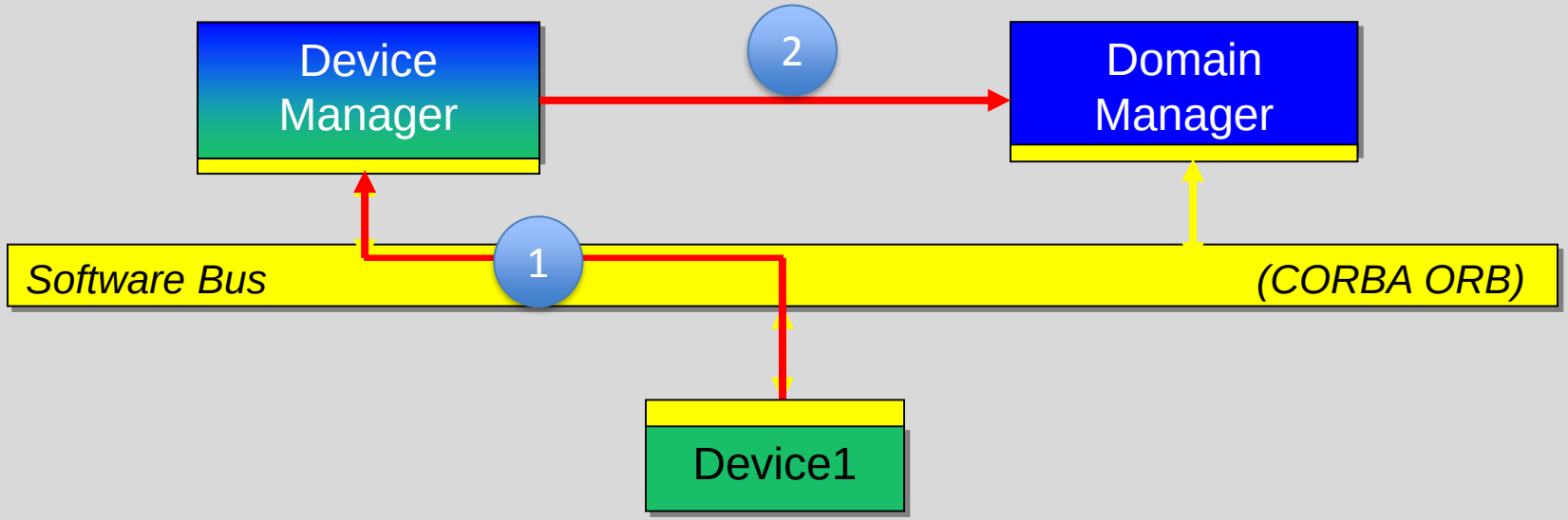
- **Control**
  - start(), stop() – Exception namespace change
- **State Machines**
  - Namespace change
- **Device Registration**
  - API change - Push & pull vs push only
- **Port Connections**
  - API change - mass connections vs single connections
- **Metadata**
  - XML Domain Profile changes

Device Registration SCAv2.2.2



1. *Device* registers with its *DeviceManager*
2. *DeviceManager* registers *Device* with *DomainManager*
3. *DomainManager* requests *Device* info from DeviceManager
4. *DomainManager* requests from *Device* Software Profile (SPD/PRF) to extract advertised capabilities

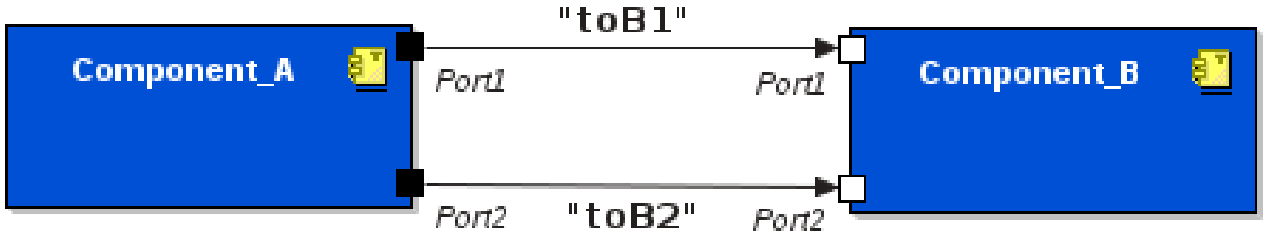
Device Registration SCAv4.1



1. *Device* registers with its *DeviceManager*
2. *DeviceManager* registers *Device* with *DomainManager*

Mass Connections

- **SCAv2.2.2**

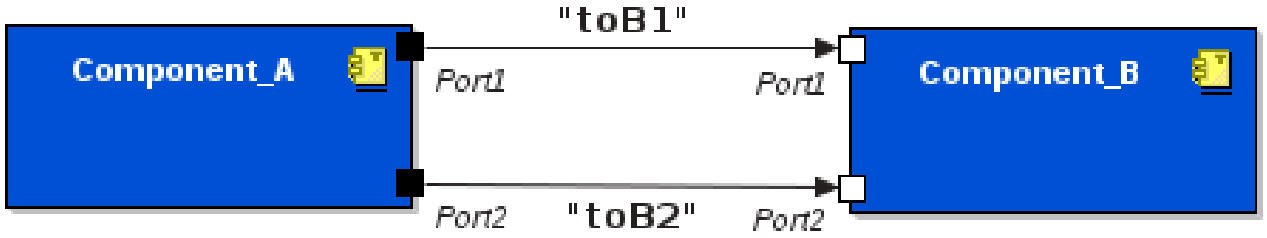


- Connections

```
portA1 = component_A.getPort(“Port1”)
portB1 = component_B.getPort(“Port1”)
portA1.connectPort(portB1, “toB1”)
portA2 = component_A.getPort(“Port2”)
portB2 = component_B.getPort(“Port2”)
portA2.connectPort(portB2, “toB2”)
```

Mass Connections

- **SCAv4.1**



  - Connection

    All provides port references are obtained at registration

    component_A.connectUsesPorts(“Port1”, ”toB1”, “Port2”, “toB2”…)

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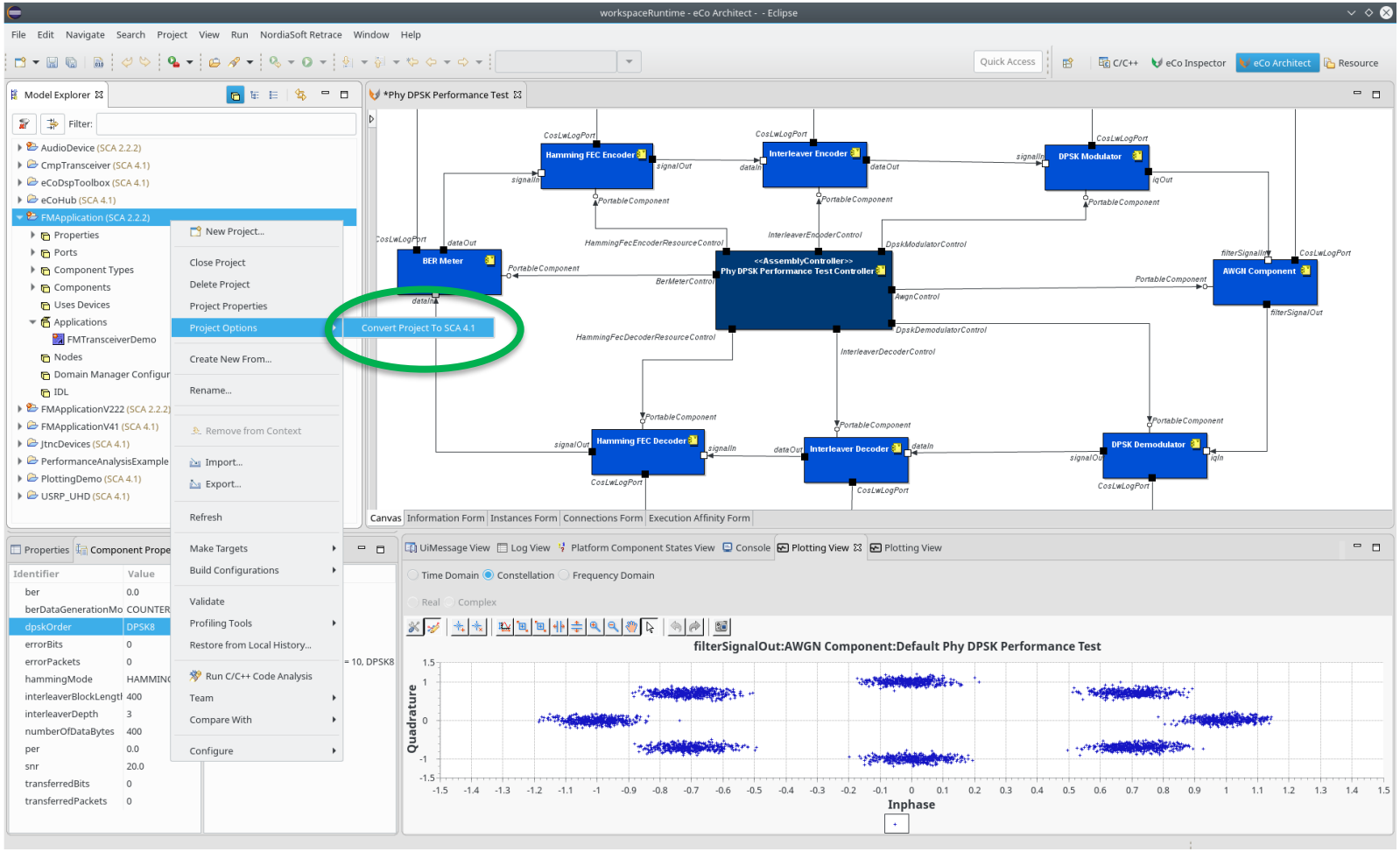
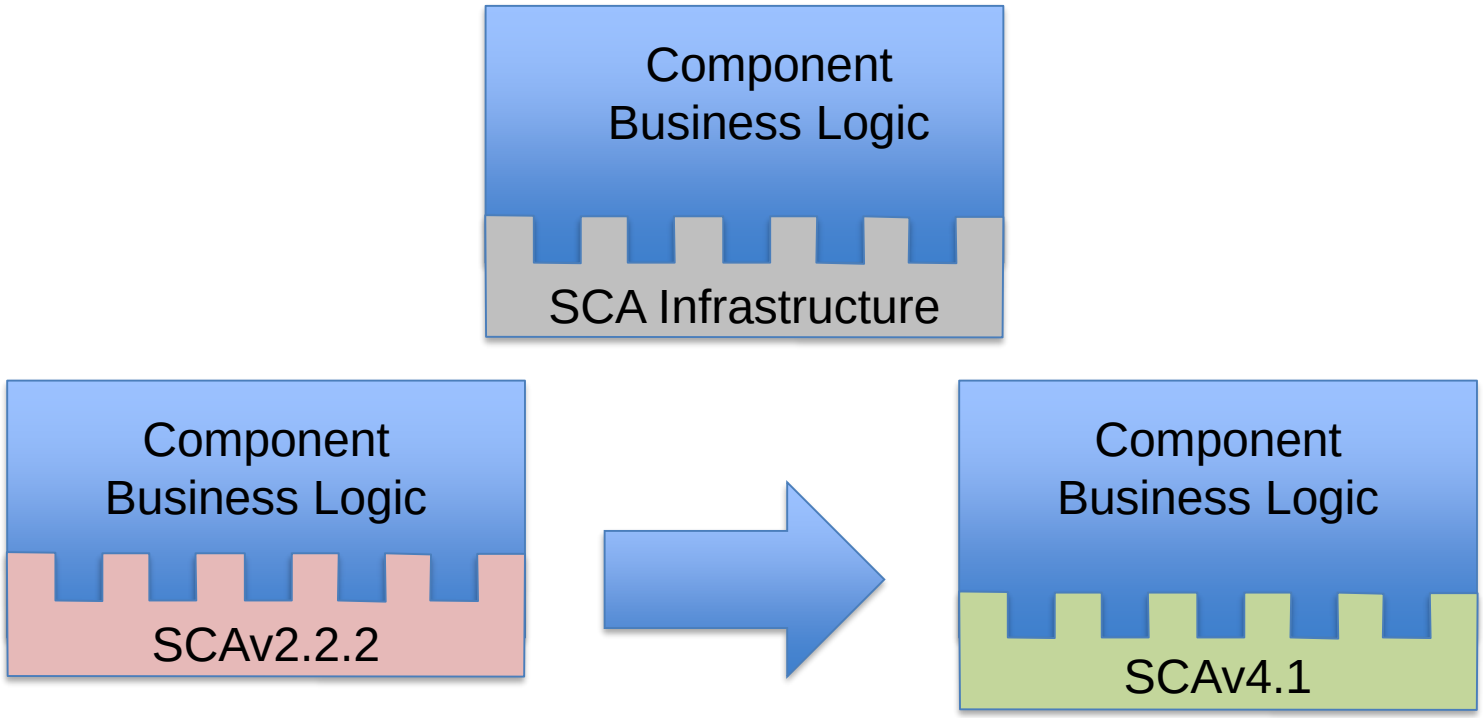


Full automatic migration from SCAv2.2.2 to SCAv4.1



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The End