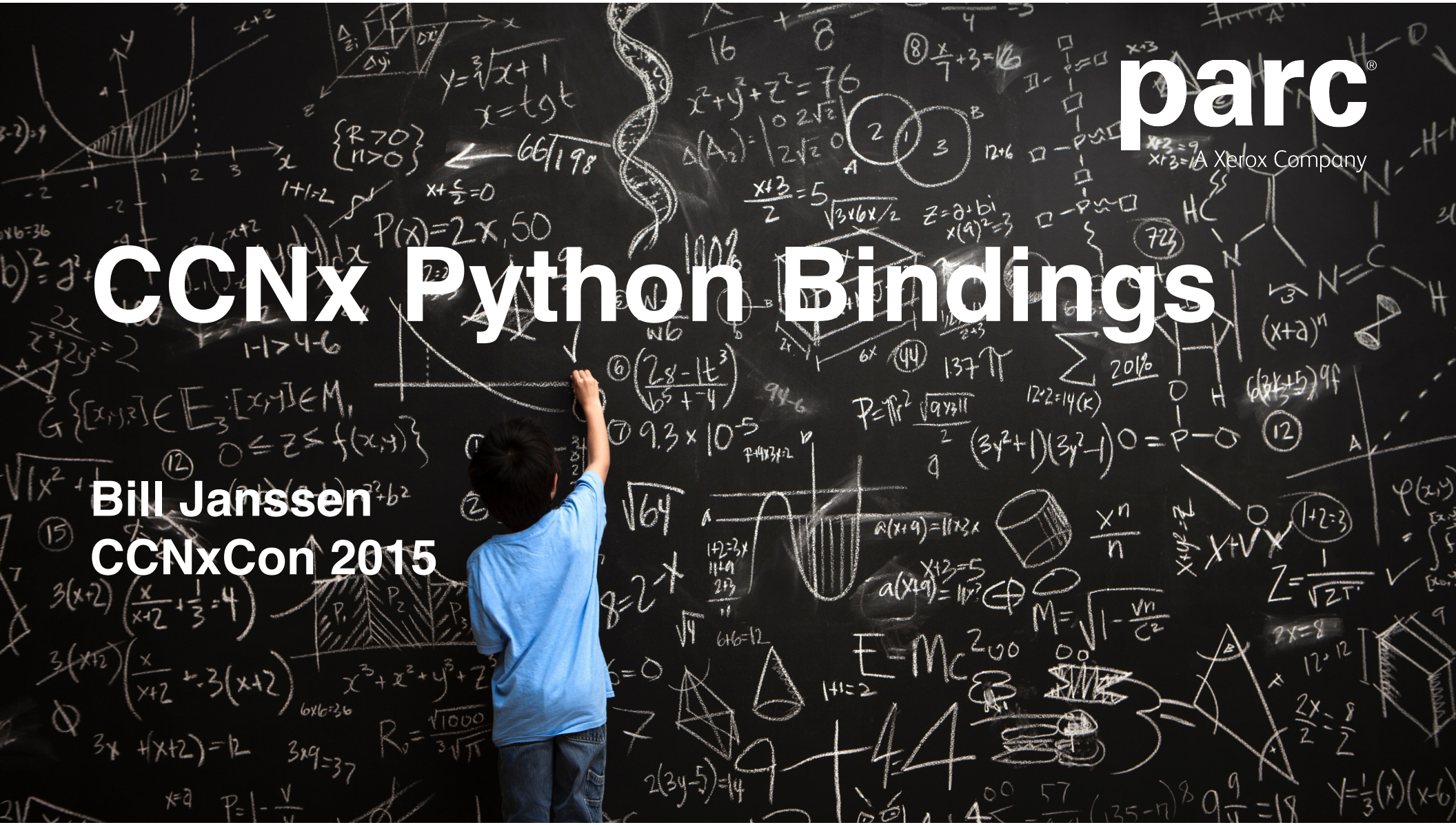

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# CCNx Python Bindings

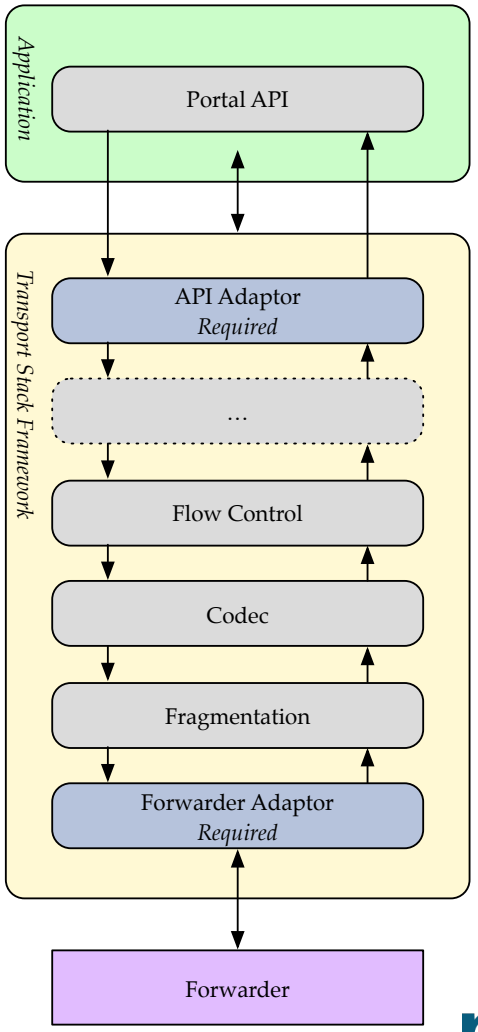
**Bill Janssen**

**CCNxCon 2015**

# The Portal API

Connecting applications to the network

Message and chunked protocols



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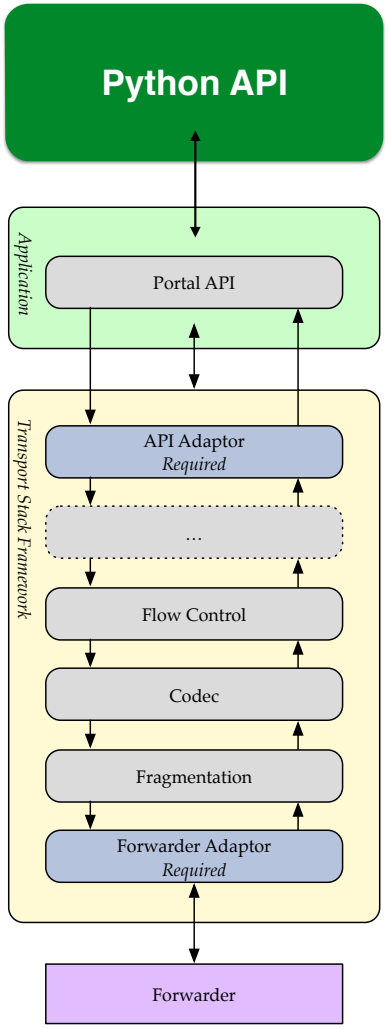
# The Portal API

Connecting applications to the network

Message and chunked protocols

**And now with added Python!**



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# Python CCNx Module

- module ‘CCNx’ generated from SWIG header files for Portal
- Small set of object classes:
  - Identity, NameSegment, Name
  - PortalFactory, Portal, Interest, ContentObject, Control, CPI
- Python 2 and Python 3
- Garbage collection cleans up after itself



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# A progressive example

```
import sys, os, time, tempfile
from CCNx import *
```



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# A progressive example

```
import sys, os, time, tempfile
from CCNx import *

ifile = tempfile.NamedTemporaryFile(suffix=".p12")
identity = create_pkcs12_file(ifile.name, "producer", "foo",
                              2048, 100)
```




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# Alternatively, create from URI…

```
import sys, os, time, tempfile
from CCNx import *

identity = Identity(
    “pkcs12-file:///home/ubuntu/.ccnx/.ccnx_keystore.p12”,
    “password”)
```

Existing certificate in .p12 file



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# A progressive example

```
import sys, os, time, tempfile
from CCNx import *

ifile = tempfile.NamedTemporaryFile(suffix=".p12")
identity = create_pkcs12_file(ifile.name, "producer", "foo",
                              2048, 100)
```




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# A progressive example

```
import sys, os, time, tempfile
from CCNx import *

ifile = tempfile.NamedTemporaryFile(suffix=“.p12”)
identity = create_pkcs12_file(ifile.name, “producer”, “foo”,
                              2048, 100)
```

```
prefix = Name("lci:/Hello")
contentName = prefix.copy().append(NameSegment("World"))
goodbyeName = prefix.copy().append(NameSegment("Goodbye"))
```



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# A progressive example

```
import sys, os, time, tempfile
from CCNx import *

ifile = tempfile.NamedTemporaryFile(suffix=“.p12”)
identity = create_pkcs12_file(ifile.name, “producer”, “foo”,
                              2048, 100)

prefix = Name("lci:/Hello")
contentName = prefix.copy().append(NameSegment("World"))
goodbyeName = prefix.copy().append(NameSegment("Goodbye"))

portal = PortalFactory(identity).create_portal()
```



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# A progressive example

```
prefix = Name("lci:/Hello")
contentName = prefix.copy().append(NameSegment("World"))
goodbyeName = prefix.copy().append(NameSegment("Goodbye"))

portal = PortalFactory(identity).create_portal()
```

```
try:
    portal.listen(prefix)
except Portal.CommunicationsError as x:
    print “producer: error listening: “ + str(x.errno)
```

Errors are signalled with exceptions



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# A progressive example

```
portal = PortalFactory(identity).create_portal()

try:
    portal.listen(prefix)
except Portal.CommunicationsError as x:
    print “producer: error listening: “, x.errno
else:
    while True:
        try:
            message = portal.receive()
        except Portal.CommunicationsError as x:
            print “producer: receive error:”, x.errno
            continue
```



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# A progressive example

```
while True:
    try:
        message = portal.receive()
    except Portal.CommunicationsError as x:
        print “producer: receive error:”, x.errno
        continue
    if not message:
        break
```

End-of-file



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# A progressive example

```
while True:
    try:
        message = portal.receive()
    except Portal.CommunicationsError as x:
        print "producer: receive error:", x.errno
        continue
    if not message:    # EOF
        break
    if (isinstance(message, Interest) and
        message.name == contentName):
```

"isinstance" used to identify type of message



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# A progressive example

```
if (isinstance(message, Interest) and
    message.name == contentName):
    payload = "Hello, World at " + time.ctime()
    co = ContentObject(message.name, payload)
    try:
        portal.send(co)
    except Portal.CommunicationsError as x:
        print "producer: error sending", x.errno
        continue
```

create payload

put it in a ContentObject

send it out



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# A progressive example

```
if (isinstance(message, Interest) and
    message.name == contentName):
    payload = “Hello, World at “ + time.ctime()
    co = ContentObject(message.name, payload)
    try:
        portal.send(co)
    except Portal.CommunicationsError as x:
        print “producer: error sending”, x.errno
        continue
```

```
elif (isinstance(message, Interest) and
      message.name == goodbyeName):
    break
```



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# In the binary release

- Example code is in the documentation
- The documentation is at **https://www.ccnx.org/releases/pythondocs/**



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# *Questions?*

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