

Interoperability Improvements

Chapel versions 1.21 / 1.22

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Outline

- [Exporting Bytes to Python](#)
- [Next Steps](#)



Exporting Bytes to Python



Exporting Bytes: Background

- Chapel didn't support exporting procedures taking/returning 'bytes', only 'string'
- Chapel 'string' type was mapped to Python 'bytes'
 - Users had to '.decode()' the 'bytes' sent to Python to get a 'str'
- 'bytes' couldn't contain null bytes
 - When it did, the bytes value would be truncated there prematurely (as in C)

Exporting Bytes: This Effort

- Added support for exporting Chapel 'bytes'

- Can be returned by value:

```
export proc retBytes(): bytes { return 'foo'; }
```

- Can be passed as an argument with the 'in' intent:

```
export proc bytesArg(in msg: bytes) { writeln(msg); }
```

Exporting Bytes: This Effort

- Chapel 'string' type now maps to Python 'str'
 - Chapel decodes Python 'bytes' to Python 'str' automatically
- Both 'string' and 'bytes' can contain null bytes

// Note the null in the middle:

```
export proc embedNull(): string { return 'F\x00oo!'; }
```

In a Python interpreter...

```
>>> test.embedNull()
```

```
'F\x00oo!'
```

Interoperability: Next Steps



Interop: Next Steps

- Support returning arrays of 'string' and 'bytes' from exported functions
 - On master already (1.23 pre-release)
- Support passing arrays of 'string' and 'bytes' as arguments
- Support use of arrays in multi-locale libraries
- Support automatically exporting records and their methods to Python

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