Measurement and Experiment Specification

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Example: Link Tracing in Emulab
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set link0 [$nodeA $nodeB ...]
Example: Link Tracing in Emulab

set link0 [$nodeA $nodeB ...]

$link0 trace
Example: Link Tracing in Emulab

set link0 [$nodeA $nodeB ...]

$link0$ trace

$link0$ trace_type packet
Example: Link Tracing in Emulab

```
set link0 [$nodeA $nodeB ...]

$link0 trace
$link0 trace_type packet
$link0 trace_type header
```
Example: Link Tracing in Emulab

```
set link0 [$nodeA $nodeB ...]

$link0 trace
$link0 trace_type packet
$link0 trace_type header
$link0 trace_type monitor
```
Example: Link Tracing in Emulab

```bash
set link0 [$nodeA $nodeB ...]
$link0 trace
$link0 trace_type packet
$link0 trace_type header
$link0 trace_type monitor
$link0 trace_snaplen 128
```
Example: Link Tracing in Emulab

```
set link0 [$nodeA $nodeB ...]

$link0 trace

$link0 trace_type packet
$link0 trace_type header
$link0 trace_type monitor

$link0 trace_snaplen 128
$link0 trace_expr "ip proto tcp"
```
Transparent Capture
Transparent Capture

$\text{link0}$
Transparent Capture

$\text{link0}$
Measurement capabilities need to be in the RSpec
Measurement in RSpec
Measurement in RSpec

Resource advertisements help users with component and link selection
Measurement in RSpec

Resource advertisements help users with component and link selection

What a slice is allowed to measure will be circumscribed by the definition of the slice
Measurement in RSpec

Resource advertisements help users with component and link selection

What a slice is allowed to measure will be circumscribed by the definition of the slice

Describing measurement hardware itself
Some users have specific measurement requirements

Question: Best level of abstraction?
  - Mark links as “measurable”
  - Explicitly include devices in topology
  - Dynamic instrumentation
Boundaries

- Once a user has a slice...
- Communication between control framework and measurement service
- Naming of measurement points
Describing Measurement Devices

- Likely to be described in different terms than “standard” components
  - Packet rate, capture size
  - Level of protocol decoding
  - Sampling, summarization ability
- Informing user about devices they may have only implicitly requested