

# Initial ConEx Deployment Examples

[draft-briscoe-conex-initial-deploy-02.txt](#)

Bob Briscoe, BT

Dirk Kutscher, NEC

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# draft status

- individual draft
- [draft-briscoe-conex-initial-deploy-02.txt](#)
- work in progress
- intended status: informational
- new co-author, Dirk Kutscher
- immediate intent:
  - WG feedback on scenarios
  - adopt as WG item?

# three example network arrangements

that have incentives for unilateral ConEx deployment

1. single receiving access network
  - presented in Taipei
2. (new) mobile network
  - simple scenario for single operator mobile network
    - problems that ConEx addresses in a mobile/cellular network
    - arrangement of ConEx functions
    - deployment incentives
    - [kutscher-conex-mobile] covers more scenarios and details
3. (new) multi-tenant data centre
  - network performance isolation
  - the subject of the body of this talk

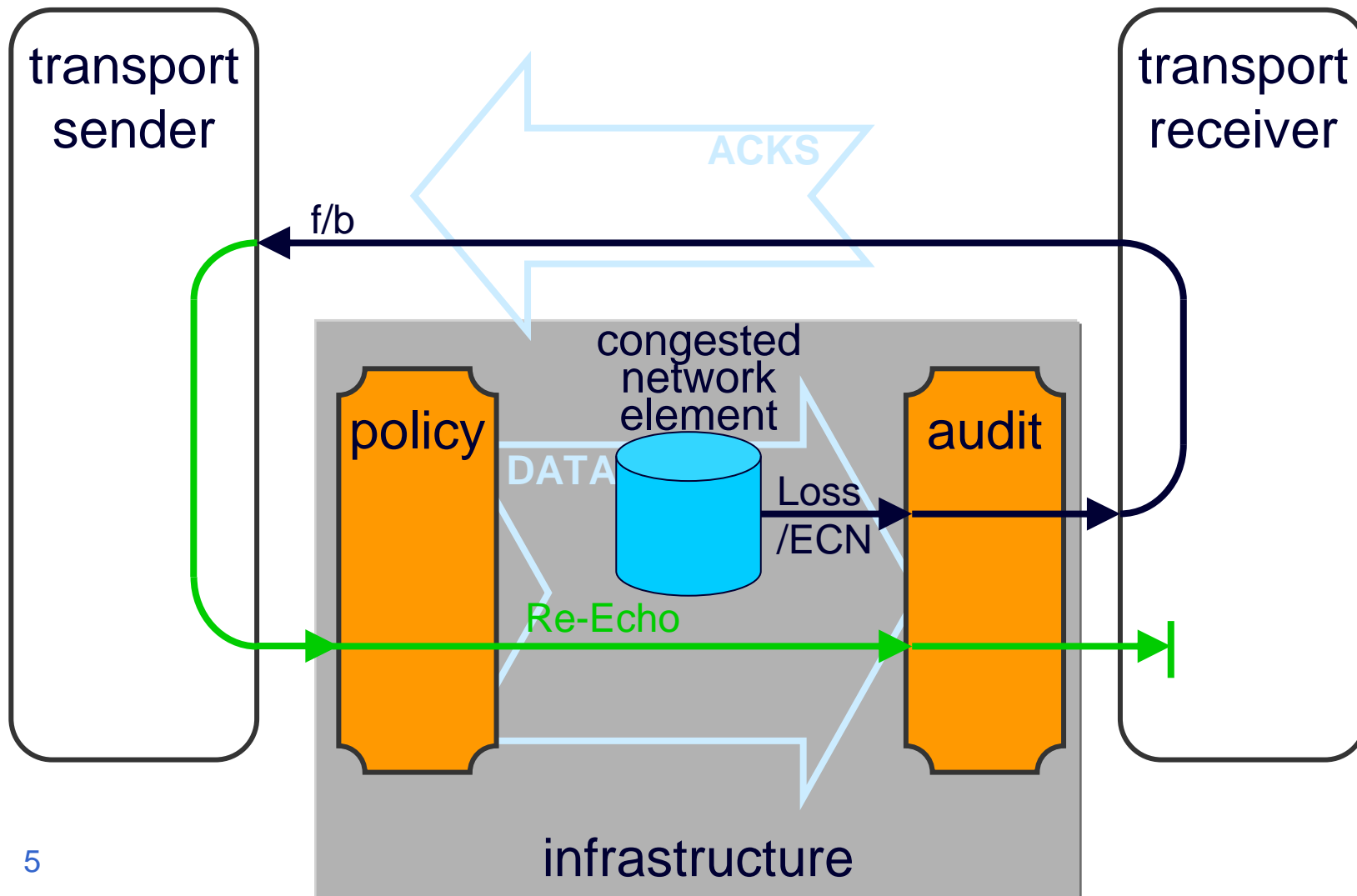
## #3 Multi-tenant data centre

# Features of ConEx Solution

- Network performance isolation between tenants
- Zero (tenant-related) switch configuration
- No loss of LAN-like multiplexing benefits
  - work-conserving
- No change to existing switch implementations
  - if ECN-capable
- Simplest possible contract
  - per-tenant network-wide allowance
  - tenant can freely move VMs around without changing allowance
  - tenant can freely move allowance between virtual machines
- Transport-Agnostic

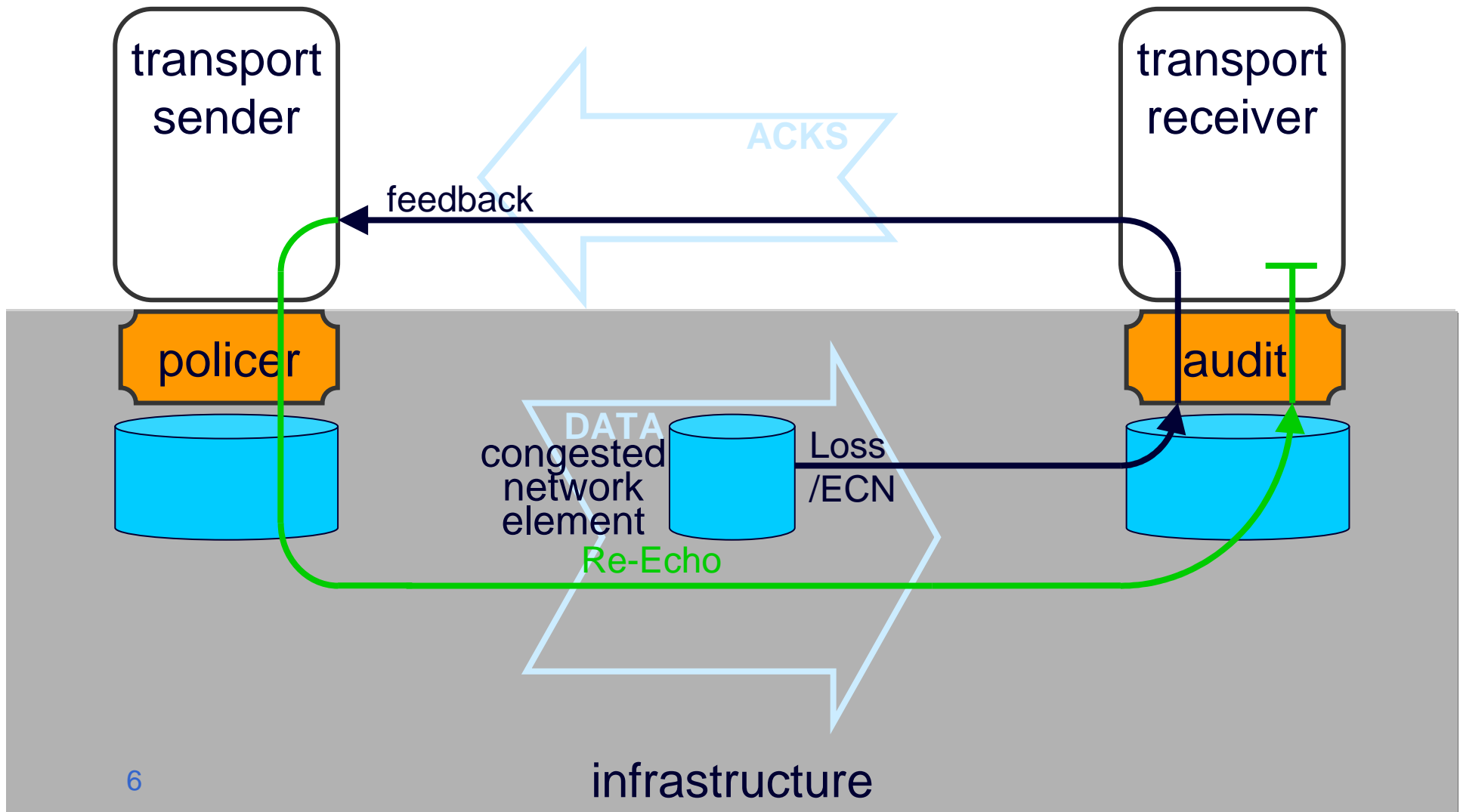
# ConEx recap

basic signals and functional units



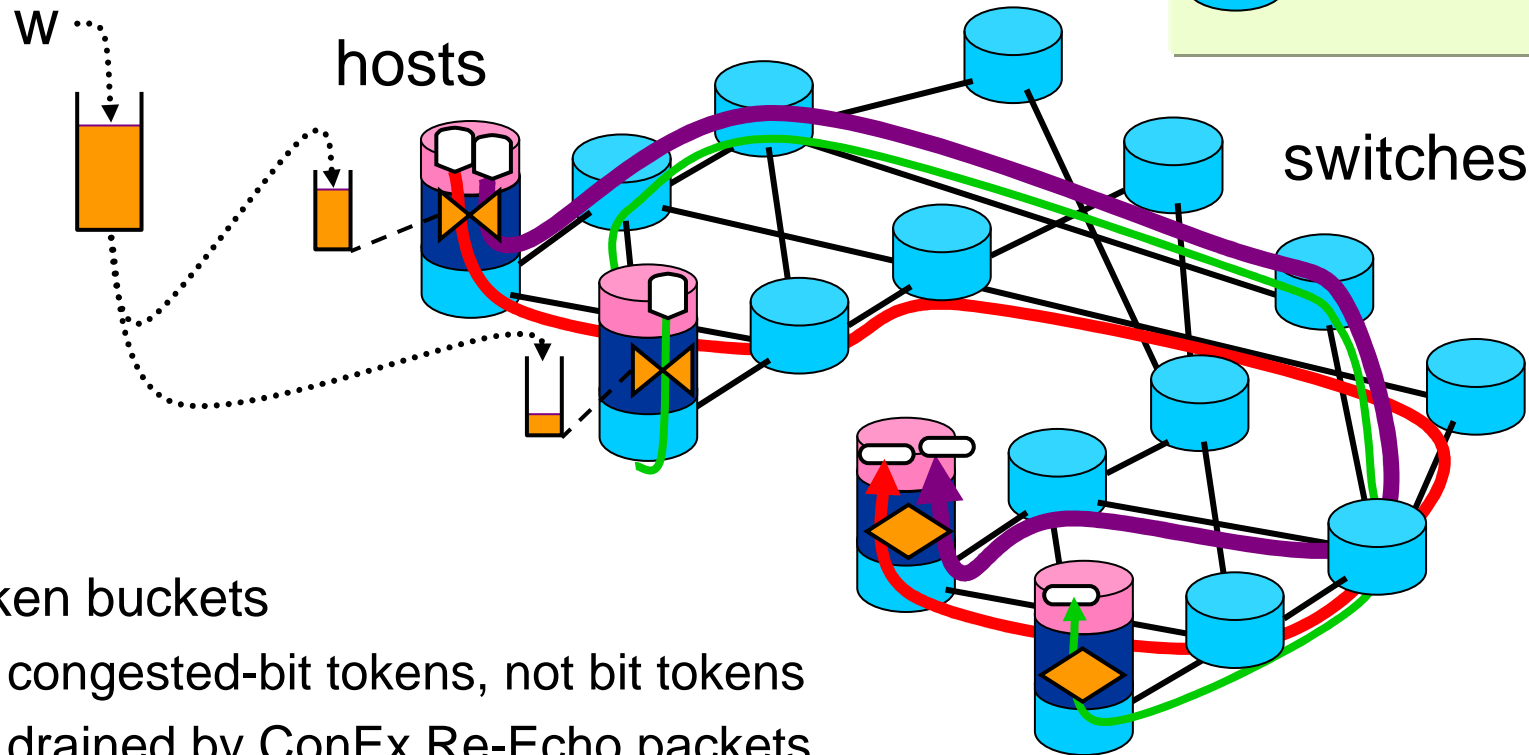
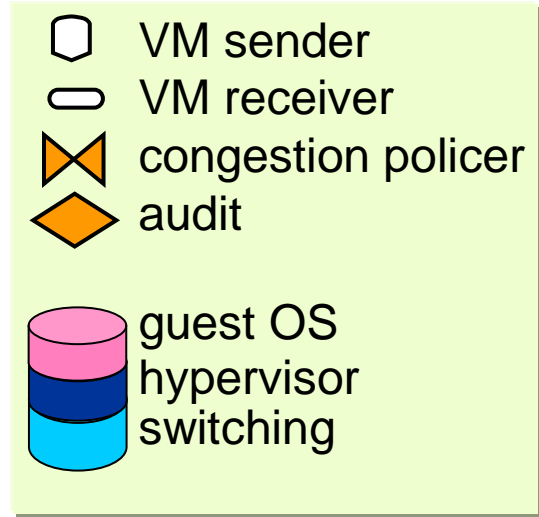
# ConEx recap

basic signals and functional units



# Arrangement of ConEx functions

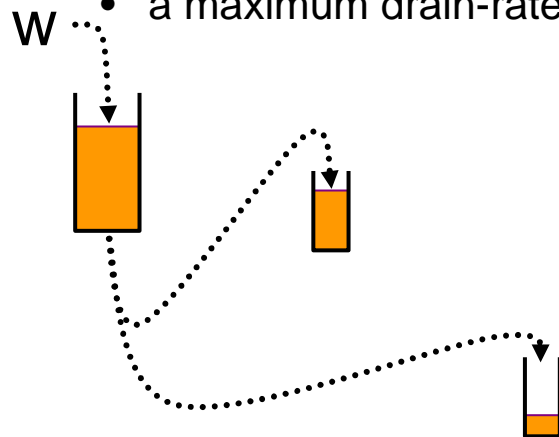
- Per-node 'congestion-policers'
  - policers created in hypervisor at VM boot
  - police all ConEx-enabled packets entering network



- Token buckets
  - congested-bit tokens, not bit tokens
  - drained by ConEx Re-Echo packets
- Filled from one single allowance (W) per tenant

# one logical token bucket per tenant

- Any one sub-bucket can fill faster than others
- subject to
  - the total fill-rate allowance  $W$
  - a maximum drain-rate per sub-bucket (not shown)

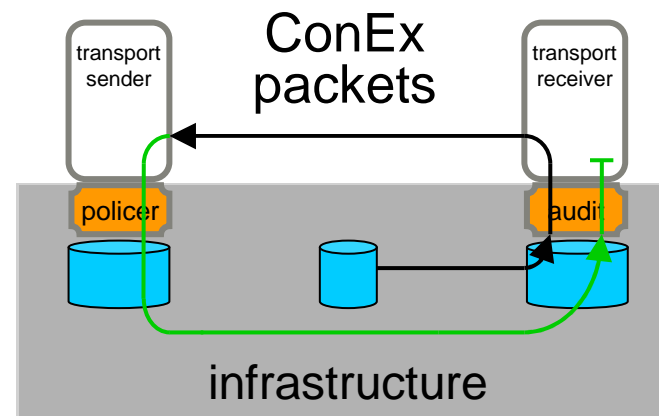


- if tokens represented bits
  - a big enough tenant could do unlimited harm to others
- but because tokens represent congested-bits
  - tokens drain faster the more a tenant harms others
- this\* provides inherent performance isolation between tenants
- while giving each tenant maximum flexibility and minimum config hassle

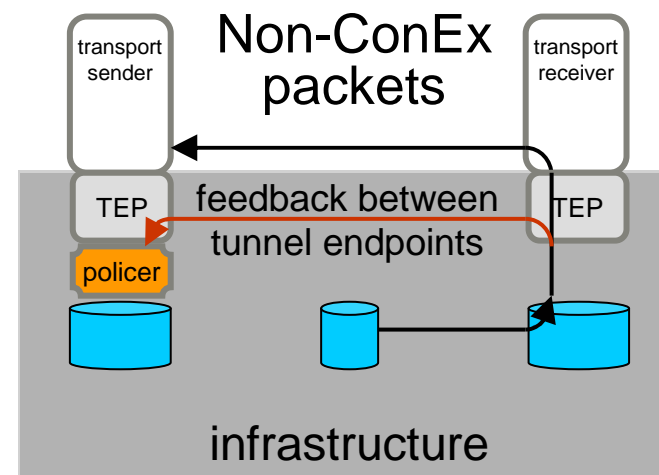
\* with max drain-rate per-sub-bucket constraint



# Deployment



- Deploy all ConEx infrastructure under control of one administration
- except for sender (and receiver)
  - need ConEx in guest OS within virtual machine
- Alternative (cf Microsoft Seawall)
  - trusted feedback tunnel back to policer
  - under control of DC operator
- Hybrid
  - non-ConEx packets: feedback tunnel
  - ConEx packets: no tunnel
  - reward ConEx for being more efficient?



# status & plans

- relationship to conex-mobile
  - mobile section in initial-deploy is for general ConEx audience
  - conex-mobile is ConEx entry-point for mobile audience
  - both hoped to become WG items
- plan – finish the document
  - re-organise to describe incentives up front
  - complete empty sections (e.g. tail pieces)

## working group input

- more reviews please
- WG feedback on choice of scenarios?
- ready to be adopted as WG item of work?

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# Q&A